
COMMONWEALTH of VIRGINIA

2014 Clean Water Act Section 319 Nonpoint Source Pollution Management Program Annual Report

and

2014 Progress Report on the ‘Chesapeake Bay and Virginia Waters Cleanup Plan’

July 1, 2013 – June 30, 2014

Supplement: TMDL Watershed Implementation Progress Summary

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INTRODUCTION: NONPOINT SOURCE POLLUTION MANAGEMENT PROGRAM

Nonpoint Source Pollution Management Program

Virginia's Nonpoint Source Pollution (NPS) Management Program is a diverse network of state and local government programs. Collectively, these programs help prevent water quality degradation and restore the health of our lakes, rivers, streams and estuaries by promoting and funding state and local watershed planning efforts, stream and wetland restoration and protection, education and outreach, and other measures to reduce and prevent NPS pollution from impacting waters of the Commonwealth. Statewide NPS pollution control programs and services support both individual natural resource stewardship and assist local governments with resource management. These statewide programs are funded through state agency budgets, non-general fund revenues and federal and non-federal grant programs. There are several state and federal laws that result in comprehensive programs that address the management of NPS pollution in the Commonwealth of Virginia. Collectively these state and federal programs and laws make up the legislative backdrop to Virginia's comprehensive NPS Pollution Management Program.

Federal Clean Water Act – Section 319 – Nonpoint Source Pollution

Section 319 of the Federal Clean Water Act (CWA) requires that states develop and implement NPS pollution management programs. Section 10.1-104.1 of the Code of Virginia designated DCR as the lead agency for the Commonwealth's NPS pollution management program. During its 2013 Legislative Session, the General Assembly passed Chapters 756 (HB2048) and 793 (SB1279) of the 2013 Virginia Acts of Assembly which designated, effective July 1, 2013, the Virginia Department of Environmental Quality (DEQ) as the lead for nonpoint source programs in the Commonwealth of Virginia (Section 10.1-104.1 of the Code of Virginia). DEQ is responsible for distribution of funds, identification and establishment of priorities of NPS related water quality problems, and the administration of an NPS advisory committee. Concluding a major activity in 2014, the Virginia Department of Environmental Quality (DEQ) in cooperation with other state, federal, regional and local agencies and other organizations, has updated the Virginia *Nonpoint Source (NPS) Pollution*

Management Program Plan; which was approved by EPA on September 30, 2014. This Plan summarizes the State's effort to prevent and control NPS pollution. The updated five-year plan identifies programs and initiatives to achieve long-term statewide NPS goals.

Chesapeake Bay and Virginia Waters Clean-up and Oversight Act of 2006 – HB1150

The *Chesapeake Bay and Virginia Waters Clean-up and Oversight Act (HB1150)* was passed during the 2006 legislative session of the Virginia General Assembly (GA) and signed into law on April 3, 2006 (Title 62.1, Chapter 3.7, section 62.1-44.117-62.1-44.118). The Act established the requirement to develop a plan for the cleanup of the Chesapeake Bay and Virginia's waters designated as impaired by EPA. Subsequently the plan also addresses the protection of water resources not yet impaired by pollution. The resulting Cleanup Plan provides clear objectives, well-developed strategies, predictable time frames, realistic funding needs, common-sense mitigation strategies, and straightforward recommendations to the General Assembly for its consideration for stream restoration and protection. The initial plan was presented to the GA in 2007. The plan was last updated in June 2009. A progress report is produced annually as well. The latest status report was presented by the Secretary of Natural Resources of the Commonwealth of Virginia to members of the GA of Virginia in December 2013. It should be noted that this plan is very comprehensive in nature and addresses both point and nonpoint pollution sources, as well as air pollution. There are, however, very specific elements of the plan related to nonpoint source pollution. As noted the above section on the CWA Section 319 program, the relevant portions of Cleanup Plan are now considered Virginia's NPS Pollution Management Program Plan. EPA Region 3 NPS Program staff has reviewed the Cleanup Plan for its appropriateness to serve as Virginia's NPS Pollution Management Program Plan. Throughout this document the progress of this plan will be highlighted.

Water Quality Monitoring, Information and Restoration Act of 1997

In 1997, the Virginia General Assembly enacted the Water Quality Monitoring, Information, and Restoration Act (WQMIRA), §62.1-44.19:4 through

19:8 of the Code of Virginia. This statute directs the Department of Conservation and Recreation (DCR) to develop a list of impaired waters, a Total Maximum Daily Load (TMDL) for each impairment, and implementation plans for these TMDLs. WQMIRA directs the Virginia Department of Environmental Quality (DEQ) to “develop and implement a plan to achieve fully supporting status for impaired waters.” In order for IPs to be approved by the Commonwealth, they must meet the requirements as outlined by WQMIRA.

The Virginia Water Quality Improvement Act of 1997

The *Virginia Water Quality Improvement Act (WQIA)* was passed during the 1997 legislative session of the Virginia GA and signed into law on March 20, 1997. This Act establishes a comprehensive statewide program to address point and non-point sources of water pollution. It creates the Virginia Water Quality Improvement Fund (WQIF) to provide assistance for water quality improvements to a broad array of entities, including local governments, soil and water conservation districts, and landowners. The fund was the principle source of state cost-share money for agricultural practices and to implement the nutrient and sediment reduction “Tributary Strategies” prepared pursuant to the Chesapeake 2000 Agreement and the *Code of Virginia*. The fund also provides grants for practices to control NPS pollution in “Southern Rivers” (SR); which are watersheds in Virginia that drain to waters other than the Chesapeake Bay. Technical and financial assistance are provided to local governments, soil and water conservation districts, and individuals through the Fund. In addition, provisions for water quality assessment and state and local cooperation are provided. DEQ is charged in assisting in the development of local cooperative NPS pollution programs and programs to implement Virginia’s nonpoint source pollution management program, in accordance with the WQIA, Section 10.1-2124.B of the *Code of Virginia*. The purpose of the cooperative nonpoint source pollution program is to maintain and/or restore water quality standards in

stream segments where NPS pollution is a significant loading factor. NPS pollution programs require locally based remedies that address the unique, site-specific, and varied causes of NPS contaminants. Cooperative NPS pollution programs are combinations of programmatic tools, and technical and financial resources of varying emphasis used to target water quality impairments in a given watershed and political jurisdiction. A cooperative approach to protecting water quality helps local stakeholders develop their capabilities individually and collectively to address local water quality impairments. In 2009 the Virginia General Assembly created the Virginia Natural Resources Commitment Fund (VNRFCF) which is a sub-fund of WQIF specifically set-aside for agricultural cost-share program and practices. Virginia’s TMDL Implementation Program has benefited from the funds provided through WQIF and VNRFCF through the funding of agricultural BMPs as well as funding for residential septic, urban and mining BMPs.

Summary of the 2014 Virginia NPS Pollution Management Program Annual Report

The 2014 NPS Management Program Annual Report for Virginia is made up of two parts, which in their entirety make up the full report of accomplishments for the Commonwealth. The first part is the “Chesapeake Bay and Virginia Waters Clean-up Plan Progress Report” and the second part is the “TMDL Implementation Supplement”. As stated previously, Virginia has a NPS planning document called the Chesapeake Bay Virginia Waters Cleanup Plan that has progress reports and strategy updates submitted to the Virginia GA on an annual basis. The annual NPS report requirement will be fulfilled by the annual progress report for the Cleanup Plan. The second part of the NPS annual report is a supplement describing the progress made in TMDL implementation. Also, this report is a comprehensive summary of the activities accomplished by the Commonwealth in TMDL implementation plan (IP) development and implementation.

2014 NPS ANNUAL TMDL SUPPLEMENTAL REPORT:

TMDL IMPLEMENTATION PROGRESS

CHAPTER 1: *TMDL Implementation Program Summary Report*

To meet the NPS annual reporting requirement for 2014 and to summarize the activities from July 1, 2013 through June 30, 2014 (FY14), DEQ has developed this ***TMDL Implementation Program Summary Report***. This report summarizes the accomplishments of the TMDL implementation program, focusing on Virginia's fiscal year 2014.

TMDL Implementation Program Background

Virginia's goal is that all rivers, lakes, streams and tidal waters attain the appropriate beneficial uses. These beneficial uses are described by the following use goals: drinking water, primary contact/swimming, fishing, shellfishing, and aquatic life. These uses are protected by application of the state's numeric and narrative water quality standards. When the beneficial uses are not being met these waters are considered "impaired" and the state must take steps to meet water quality standards to ensure that water quality is restored. One very important step in restoring water quality in the impaired streams is the development of TMDLs.

The goal of TMDL program is to achieve attainment of water quality standards. The Commonwealth achieves this goal by means of a three-phase process: TMDL development, development of TMDL implementation plans (IPs) and/or permit conditions, and implementation of permit conditions and/or best management practices. TMDL reports,

implementation plans and implementation progress updates are available on the DEQ TMDL website at: <http://www.deq.state.va.us/Programs/Water/WaterQualityInformationTMDLs/TMDL.aspx>.

TMDL Implementation Plans

Virginia state law, WQMIRA, requires the development of a TMDL IP after a TMDL is developed and approved by EPA. The IP describes the measures and timeline to meet the TMDL, and includes estimated costs, and a monitoring plan.

In FY2014, DEQ and other partners developed 4 IPs covering 18 impaired segments. In addition, 6 IPs covering 18 impairments were under development, but were not completed or approved by the end of the fiscal year. Since 2000, Virginia has completed 72 IPs, addressing 354 impairments.

Figures I-1 summarizes TMDL implementation plan development in Virginia since 2001. In the majority of cases, watersheds that have a completed implementation plan also have TMDL implementation projects underway. A summary of completed TMDL implementation plans is provided in Table I-1, while Figure I-2 shows the location of TMDL planning/implementation watersheds across the state.

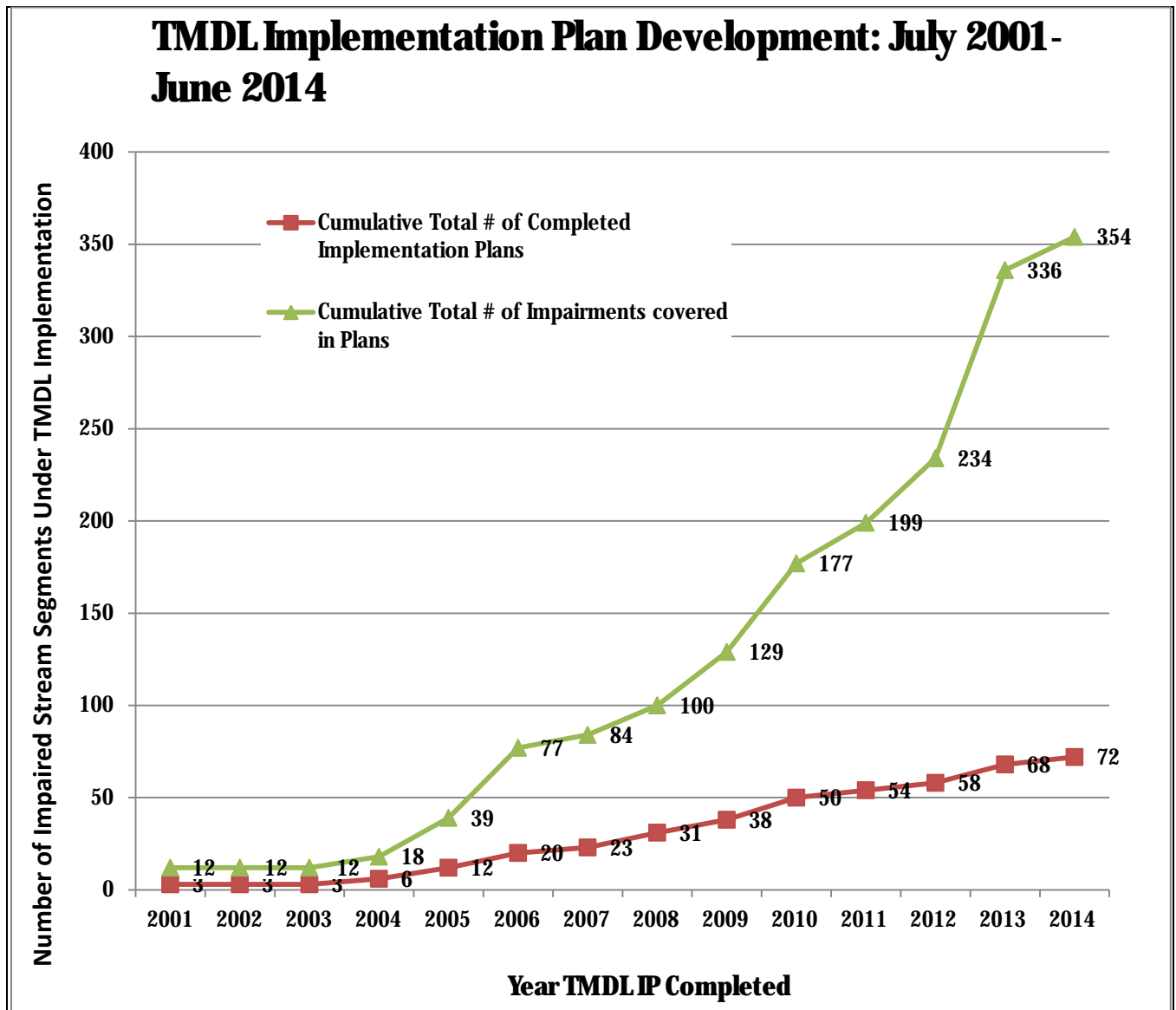
Figure I-1. Cumulative summary of TMDL Implementation Plan development

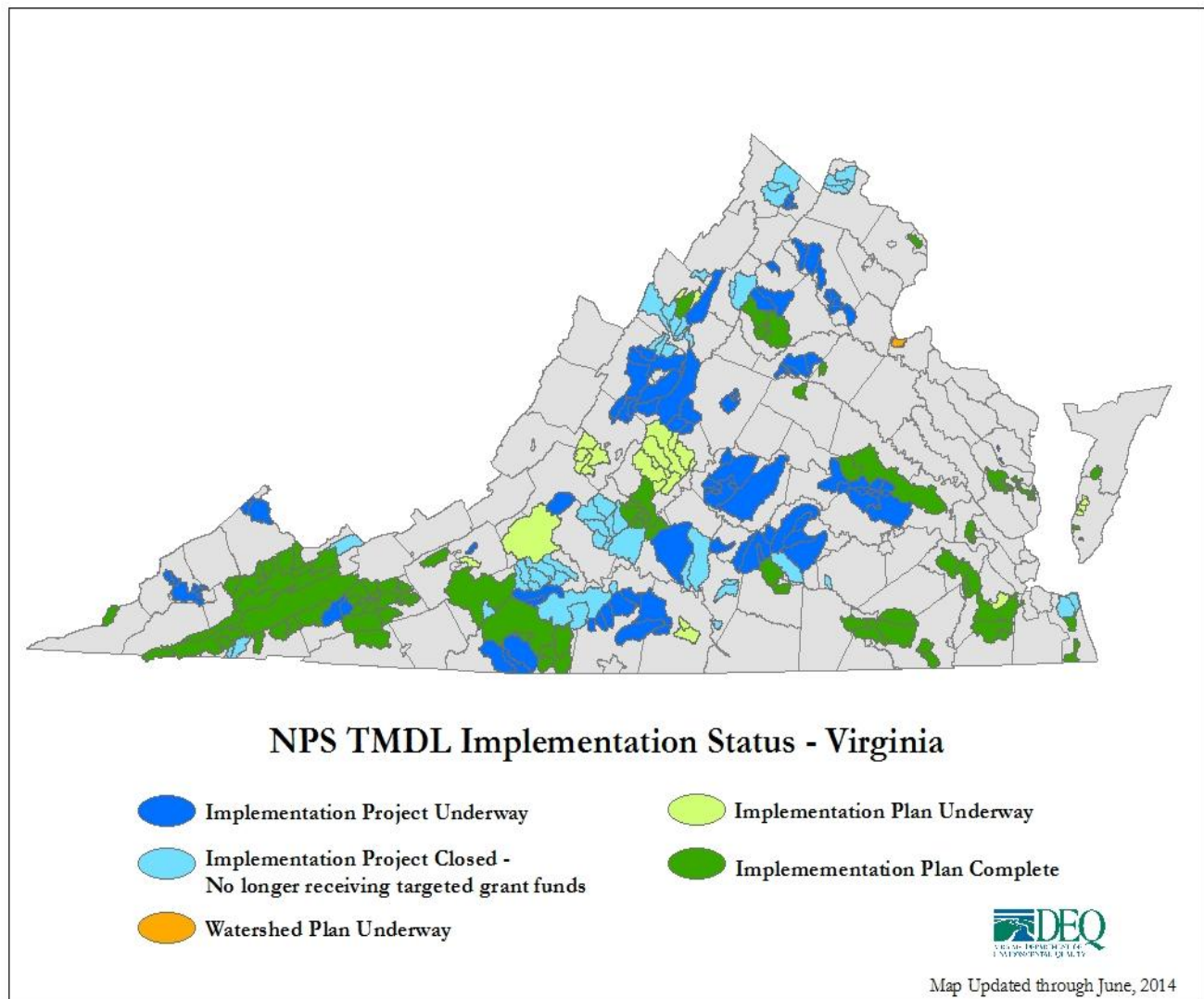
Table I-1. Completed TMDL Implementation Plans, January 2001- June 2014

Watershed (# of impairments / # of impaired segments)	Location (county or city)	Impairment	Lead	Completion date
Middle Fork Holston (3/3)	Washington	Bc	DCR	2001
North River (Muddy, Lower Dry, Pleasant, and Mill Creek) (5/4)	Rockingham	Bc, Be	DCR	2001
Upper Blackwater River (4/4)	Franklin	Bc	DCR	2001
Catoctin Creek (4/4)	Loudoun	Bc	DCR	2004
Holmans Creek (2/2)	Shenandoah	Bc, Be	DCR	2004
Four Mile Run (1/1)	Arlington, Alexandria	Bc	DEQ	2004
Willis River (1/1)	Cumberland, Buckingham	Bc	DCR	2005
Chowan Study Area (9/9)	Multiple Counties	Bc	DEQ	2005
Moores Creek (1/1)	Charlottesville, Albemarle	Bc	DEQ	2005
Guest River (5/5)	Wise, Scott, Dickenson	Be	DEQ	2005
Lower Blackwater, Maggoddee and Gills Creek (3/3)	Franklin	Bc	DCR	2005
Lynnhaven (shellfish) (2/2)	VA Beach	Bc	DEQ	2005
Cooks Creek and Blacks Run (6/2)	Rockingham, Harrisonburg	Bc, Be	DCR	2006
Thumb, Deep, Carter and Great Runs (4/4)	Fauquier, Stafford	Bc	DCR	2006
Big Otter (8/8)	Bedford, Campbell	Bc	DCR	2006
Mill and Dodd Creeks (2/2)	Floyd, Montgomery	Bc	DCR	2006
Little and Beaver Creek (3/2)	Bristol, Washington	Bc, Be	DCR	2006
Stroubles Creek (1/1)	Montgomery	Be	DEQ	2006
Back Creek (2/1)	Pulaski	Bc, Be	DEQ	2006/2007
Abrams and Opequon Creek (8/5)	Frederick, Winchester	Bc, Be	DEQ	2006
Knox and PawPaw Creek (4/2)	Buchanan	Bc, Be	DEQ	2007
Hawksbill and Mill Creek (2/2)	Page	Bc	DCR	2007
Looney Creek (1/1)	Botetourt	Bc	DCR	2007
Upper Clinch River (1/1)	Tazewell	Be	DCR	2008
Occahannock Creek (shellfish) (1/1)	Accomack	Bc	DCR	2008
Falling River (1/1)	Campbell, Appomattox	Bc	DCR	2008
Dumps Creek (2/1)	Russell	TSS, TDS	DEQ	2008
Bluestone River (1/2)	Tazewell, Bluefield	Bc, Be (sed)	DCR	2008
Smith Creek (1/2)	Rockingham, Shenandoah	Bc, Be (sed)	DEQ	2008
Appomattox River – Spring Creek, Briery Creek, Bush River, Little Sandy River and Saylers Creek (5/5)	Prince Edward, Amelia	Bc	DCR	2008
Appomattox River – Flat, Nibbs, Deep and West Creeks (4/4)	Amelia, Nottoway	Bc	DCR	2008
Straight Creek, Stone Creek and Tributaries (3/3)	Lee	Bc, Be (sed)	DEQ	2009
Long Glade Run, Mossy Creek and Naked Creek (5/3)	Augusta, Rockingham	Bc, Be (sed)	DCR	2009
Back Bay Watershed (1/1)	City of Virginia Beach	Bc	DEQ	2009
North Landing Watershed (4/4)	City of Virginia Beach	Bc	DEQ	2009
Pigg River and Old Womans Creek (8/8)	Franklin, Pittsylvania	Bc	DEQ	2009
Cub, Turnip, Buffalo and UT Buffalo Creeks (4/4)	Appomattox, Charlotte	Bc	DCR	2009
Hazel River Watershed (4/4)	Culpeper, Madison, Rappahannock	Bc	DCR	2009
Greenvale Creek, Paynes Creek and Beach Creek (shellfish)(3/2)	Lancaster	Bc	DCR	2010
Ash Camp and Twitty's Creek (2/2)	Charlotte	Be (sed)	DCR	2010
Upper & Lower Middle River, Moffett Creek & Polecat Draft (7/5)	Augusta	Bc, Be (sed)	DCR	2010
Mill and Powhatan Creek (2/2)	James City County	Bc	DEQ	2010
Lewis Creek (1/1)	Russell	Be (sed)	DCR	2010
Browns, Craig and Marsh Runs (3/3)	Fauquier	Bc	DCR	2010
Little Dark Run and Robinson River (3/3)	Culpeper & Madison	Bc	DCR	2010

Watershed (# of impairments / # of impaired segments)	Location (county or city)	Impairment	Lead	Completion date
Rock Island, Austin, Frisby, Troublesome Creeks, North and Slate Rivers (6/6)	Buckingham	Bc	DCR	2010
Hays, Moffatts, Otts and Walker Creeks (4/4)	Augusta & Rockbridge	Bc	DCR	2010
Christians Creek and South River (6/3)	Augusta & Waynesboro	Bc, Be (sed)	DCR	2010
South James River, Ivy, Tomahawk, Burton, Judith, Fishing, Blackwater and Beaver Creeks (8/8)	Campbell, Bedford, Amherst, Lynchburg	Bc	DEQ	2010
Nansemond River, Shingle Creek (3/3)	Suffolk	Bc	DEQ	2010
Cherrystone Inlet, Kings Creek (shellfish) (1/1)	Northampton	Bc	DCR	2011
Roanoke River Watersheds – Upper Banister River and Stinking River, Bearskin, Cherrystone and Whitethorn Creeks (5/5)	Pittsylvania	Bc	DCR	2011
York Basin Watersheds – Beaver Creek, Goldmine Creek, Mountain Run, Pamunkey Creek, Plentiful Creek, Terry's Run (6/6)	Louisa, Orange, Spotsylvania	Bc	DCR	2011
James River Watersheds- James River and Bernards, Powhite Reedy, Gilles, Almond, Goode, Falling and Noname Creeks (10/10)	Chesterfield, Powhatan, Henrico, Richmond	Bc	DEQ	2011
Little River Watershed – Little River, Meadow Run, Pine, West Fork Dodd, Dodd, Meadow, Brush, Laurel, Big Indian Creeks (26/26)	Montgomery & Floyd	Bc, Be (sed), Temp	DEQ	2012
Clinch River; Coal, Middle, and Plum Creeks (7/7)	Tazewell	Bc, Be (sed)	DEQ	2012
Hoffler Creek (1/1)	Suffolk & Portsmouth	Bc	DEQ	2012
Mill Creek (1/1)	Northampton	Be (DO, pH)	DEQ	2012
Lower Banister River, Polecat Creek and Sandy Creek (3/3)	Halifax, Pittsylvania	BC	DCR	2013
Middle Fork Holston River & Wolf Creek (8/6)	Abingdon, Smyth, Washington, Wythe	Bc, Be (sed)	DCR	2013
Spout Run (4/3)	Clarke	Bc, Be (sed)	DCR	2013
Piankatank River, Milford Haven, Gwynns Island (17/16)	Mathews, Middlesex, Gloucester	Bc	DCR	2013
Mill Creek, Cove Creek, Miller Creek, Stony Fork, Tate Run, S.F. Reed Creek, Reed Creek (9/9)	Wythe	Bc	DEQ	2013
Beaverdam, Boatswain Creek, Chickahominy River, Collins Run, Stony Run (5/5)	Hanover, Henrico, Charles City, Richmond	Bc	DEQ	2013
Rockfish River (4/4)	Nelson	Bc, Be (sed)	DEQ	2013
South Fork Mayo River, North Fork Mayo River, Blackberry Creek, Smith Creek, Marrowbone Creek, Leatherwood Creek (8/8)	Henry, Patrick, and City of Martinsville	Bc	DEQ	2013
Darden Mill Run, Mill Swamp, Three Creek (9)	Brunswick, Greensville & Southampton	Bc	DEQ	2013
North Fork Holston River (35/35)	Scott, Washington, Smyth, Russell, Bland, Tazewell	BC, Temp	DEQ	2013
Turley Creek, Long Meadow (2/2)	Rockingham	Be (sed)	DEQ	Not approved
Moore's Creek, Lodge Creek, Meadows Creek and Schenks Branch (4/4)	Albemarle and Charlottesville	Be (sed)	DEQ	Not Approved
Linville Creek (2/1)	Rockingham, Broadway	Bc, Be (sed)	DCR	2014
Wards Creek, Upper Chippokes Creek, Western Run, Crewes Channel, West Run, James River (6/6)	Charles City, Henrico & Hanover	Bc	DEQ	2014
Elk and Cripple Creek (2/2)	Grayson & Wythe	Bc	DEQ	2014
Tye River, Hat Creek, Rucker Run, Piney River, Mill Creek, Turner Creek, Rutledge Creek, Buffalo River (8/8)	Amherst, Nelson	Bc,	DEQ	2014
Roanoke River Watersheds – South Fork, Smith Creek, Bradshaw, North Fork, Wilson Creek, Mud Lick Creek, Mason Creek, Murray Run, Ore Branch, Perters Creek, Roanoke River, Carvin Creek, Glade Creek, Laymantown Creek, Tinker Creek, Back Creek (55)	Botetourt, Montgomery, Roanoke, Roanoke City, Salem, Town of Vinton	Bc, Be (sed)	DEQ	UD

Watershed (# of impairments / # of impaired segments)	Location (county or city)	Impairment	Lead	Completion date
Mattawoman, Hungars, UT-Hungars, Barlow, Jacobus, The Gulf (6/6)	Northampton	Bc	DEQ	UD
Chuckatuck Creek, Brewers Creek (2/2)	Suffolk	Bc	DEQ	UD
Colliers Creek, North Fork Buffalo Creek, South Fork Buffalo Creek, Buffalo Creek, Cedar Creek (5/5)	Rockbridge	Bc	DEQ	UD
Crab Creek (2/1)	Town of Christiansburg, Montgomery County	Bc	DEQ	UD
Fairview Beach (1/1)	King George	Bc	DEQ	UD
Banister River, Winn Creek (2/2)	Town of Halifax, Halifax	Bc	DEQ	UD
Total IPs Completed: 72 Plans, 354 Impairments; Total IP complete but not approved, 2; Total IPs Under Development (UD): 7 IPs, 73 impairments. Impairment types: Bc = bacteria, Be = Benthic, TSS = Total suspended solids, TDS = Total dissolved solids, Sed = sediment				

Figure I-2: NPS TMDL Implementation Plan Status in Virginia through June 30, 2014



Watershed Restoration and TMDL Implementation

The goal of the TMDL Implementation Program is to implement targeted, on-the-ground activities, identified in TMDL implementation plans, which will result in water quality improvements and subsequent delisting of impaired streams. Virginia uses a staged approach that provides opportunities for periodic evaluation of the effectiveness of the implementation actions and adjustment of efforts to achieve water quality objectives in a timely and cost-effective manner.

Virginia's TMDL Implementation Program was developed by DCR in 2001 and has been funded by a mix of federal and state funds. In June 2013 the program began to be administered by DEQ. Since 2001 the program has provided federal and state resources to 49 TMDL Implementation Projects.

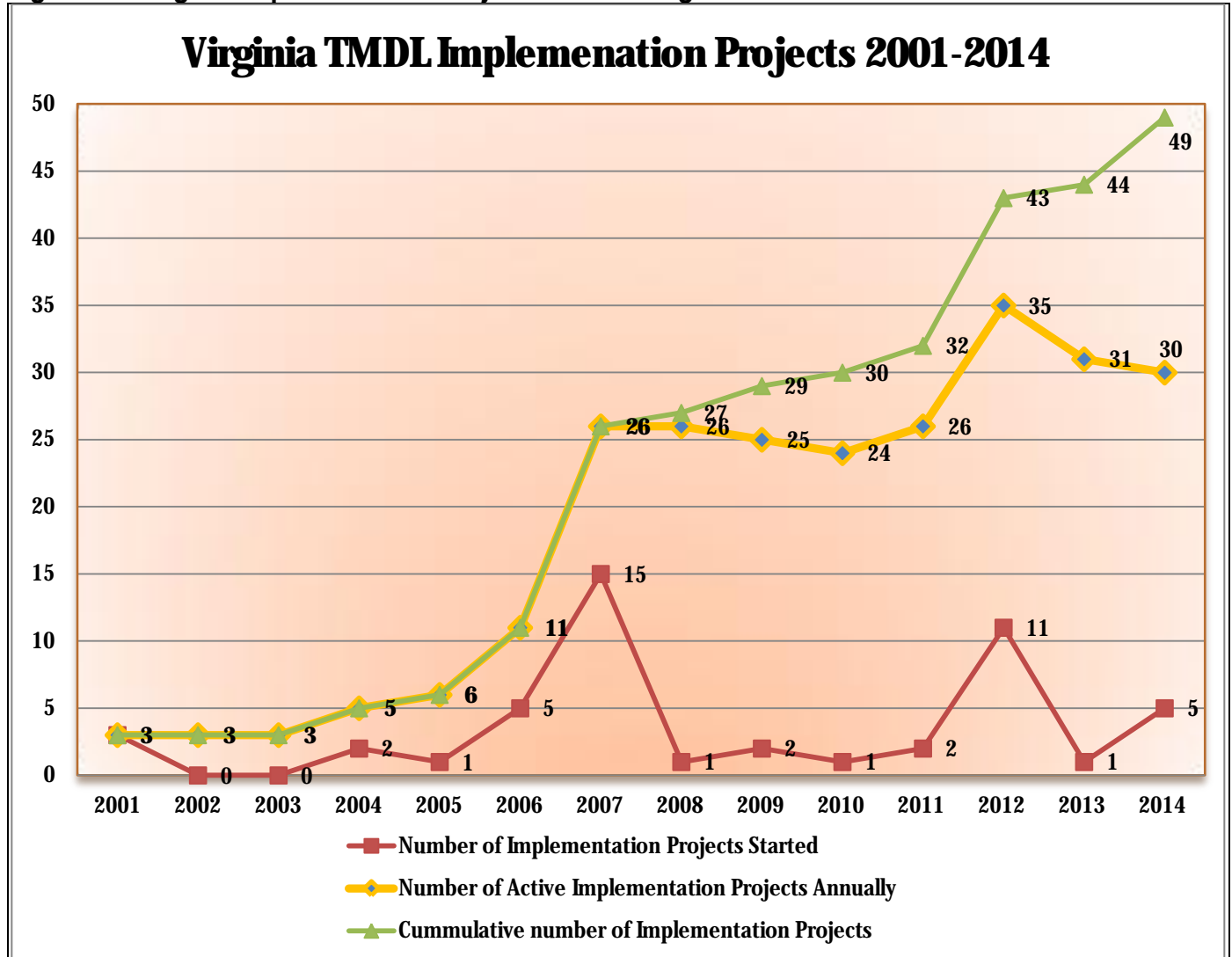
From January 1, 2013 through June 30, 2014 DEQ and DCR managed 36 implementation projects supported by Federal EPA §319(h) and/or state Virginia Natural Resources Conservation Fund (VNRFCF). In addition there were 8 implementation plan areas where specific projects were not active but which state Virginia Agricultural Cost-share (VACS) funds were provided. Collectively these projects spent \$7,449,623 on 855 BMPs installed in Targeted TMDL watersheds.

Federal §319(h) Projects: Virginia's first TMDL implementation projects, also known as "pilot projects" were started by DCR in 2001 and funded through federal section 319 with the Upper Blackwater River, Middle Fork Holston River, and North River. The first two projects ended in 2007 while the North River finished in August 2008. Since initiation of these pilot projects, DCR/DEQ has initiated a total of 27 additional TMDL implementation projects across the state (Table I-2) with 319(h) funding. In addition, as of June 2014 DCR/DEQ has completed and closed implementation for ten projects. Since July 2013 implementation was started in 7 project areas (Rockfish River, South Mayo and North Fork Mayo River, Spout Run, James

River, Lower Banister River, Middle Fork Holston River, and Stroubles Creek).

These projects are primarily funded with Section 319 federal funds; however, several projects have also received non-federal money to fund urban and/or septic BMP installation. In addition DCR was successful in securing over \$5.5 million of state VNRFCF to augment federal 319 funds for agricultural BMPs. In 2014 a total of 20 projects were implemented using Federal 319 funds; of these projects ten (Thumb/Deep/Carter/Great Runs, Upper Hazel River, Craig/Brown/Marsh Runs, Moores Creek, Lewis Creek, Looney Creek, Guest River, Knox and PawPaw Creeks, Upper York River, and Hays/Moffatts/Otts/Walker Creeks) received state VNRFCF money to fund agricultural practices. It is hoped that Virginia will eventually fund all agricultural practices for TMDL implementation projects using a variety of sources such as state cost-share, Natural Resources Conservation Service (NRCS), 319, and private funds, while section 319 will also fund mining, residential septic, urban/residential stormwater, and pet waste practices identified in TMDL implementation plans.

State funded VNRFCF Targeted TMDL Projects: In 2006 DCR started 17 implementation projects for 46 impaired segments utilizing state funding through the WQIF and eventually VNRFCF. In 2013 DEQ took over as the lead nonpoint source agency in Virginia and assisted DCR in administering these projects consistent with the statewide TMDL implementation program. These projects were the start of the state focusing funding to implement TMDLs. In 2012 DCR started funding livestock exclusion practices in three additional TMDL implementation plan areas. Currently all 14 projects receive funding for agricultural practices through the state cost-share program, while several project sponsors have pursued competitive grant funds to implement urban and septic management practices. DEQ hopes that eventually it will be able to identify and secure consistent funding for all aspects of the TMDL implementation plans for these project areas. Implementation on most of these projects will continue through the end of FY 2015.

Figure I-3: Virginia Implementation Projects 2001 through 2014

Virginia's TMDL Implementation Program in 2014

During the period of July 1, 2013 to June 30, 2014, Virginia's TMDL Implementation Program included 20 implementation projects currently or previously funded with Federal 319(h) funds (augmented with some state funds), and 10 projects receiving TMDL state funds for agricultural implementation in specific TMDL watersheds (Table I-2). In addition there were 14 implementation areas that received state cost-share funds for implementation but did not have, or no longer had a TMDL implementation project.

These 44 implementation initiatives collectively disbursed \$7,449,623 of cost-share funds implementing 855 agricultural and residential BMPs. This included 325 BMPs funded with 319(h) and 102 BMPs funded thru VNRCF or WQIF TMDL funding. This implementation resulted in over 230,997 feet of stream exclusion, and the reduction of 1.295+16 colony forming units (CFU) of fecal coliform bacteria, 52,722 pounds of nitrogen, 8,726 pounds of phosphorous, and 8,606 tons of sediment.

Table I-2. Summary of Virginia TMDL Implementation, January 2001-June 2014

Watershed Area	TMDL Segment	Status	Years of Implementation	Funds Used
Twenty Projects receiving Federal 319(h) as well as State WQIF and VNRCF between July 2013 and June 2014; VACS thru 2014				
Willis River	VAC-H36R	delisted (3) segments, Success Story 2010	2005-2015	§319(h), VNRCF
Thumb, Great, Carter and Deep Runs	VAN-E01R, E02R & E10R	Some improvement, Carter Run Success Story 2013 delisting	2006-2015	§319(h), VNRCF ()
Hazel River	VAN-E03R, E04R, E05R	None reported	2009-2015	§319(h), VNRCF, WQIF RFP
Looney Creek	VAW-I26R	Some Improvement –Ellis Run and Mill Creek	2009-2014	§319(h), VNRCF
Slate River and Rock Island Creek	VAC-H1/R, H21R, H22R	Too Early	2010-2015	§319(h), VNRCF
Craig Run, Browns Run and Marsh Run	VAN-E08R	Too Early	2012-2015,	§319(h), VNRCF, VNRCF-CBLEI
Moore's Creek	VAV-H28R	Some improvement	2012-2014	§319(h), VNRCF, WQIF RFP
Smith Creek	VAV-I347R	Too Early	2012-2015, 2008+ for NRCS	§319(h), NRCS
Guest River	VAS-P11R	None reported	2012-2014	§319(h), VNRCF, WQIF RFP
Lewis Creek	VAS-P04R	Too Early	2012-2014	§319(h), VNRCF
Upper York River	VAN-F06R, F07R	Too Early	2012-2014	§319(h), VNRCF
Hays, Moffats, Otts, and Walker Creeks	VAN-I34R	Too Early	2012-2014	§319(h), VNRCF
Knox and Pawpaw Creek	VAS-Q03R	Too Early	2012-2014	§319(h), VNRCF
Rockfish River	VAV-H09R, H10R, H13R	Too Early	2013-2015	§319(h)
Spout Run	VAV-B57R	Too Early	2014-2016	§319(h)
South Mayo River and North Fork Mayo River	VAW-L43R	Too Early	2012-15: VNRCF 2014-16: 319(h)	§319(h), §319(h), SRLEI
Lower Banister River	VAC-L67R, L70R, L71R	Too Early	2012-15: VNRCF 2014-16: 319(h)	§319(h), SRLEI
James River		Too Early	2014-2016	§319(h)
Middle Fork Holston River	VAS-O03R	Too Early	2014-2016	§319(h)
Stroubles Creek	VAW-N22R	Some Improvement	2006+, 319(h) 2014-2016	§319(h), WQIF RFP
Federal EPA NPS Implementation Grant (319h); Watershed Improvement Fund Request for Proposals (WQIF RFP), State VNRCF Chesapeake Bay Livestock Exclusion Initiative TMDL (CBLEI-TMDL), VNRCF Southern Rivers Livestock Exclusion Initiative (SRLEI)				

Watershed Area	TMDL Segment	Status	Years of Implementation	Funds Used
Ten Projects funded by WQIF/VNRCF funds for agricultural BMPs in 2014; plus continuous funding thru 2014 from VACS				
Falling River	VAW-L34R	Some improvement-mainstem	2007 - 2014	WQIF, VNRCF
Mossy and Naked Creeks, Long Glade Run	VAV-B19R, B24R, B28R	Some improvement	2007 - 2014	WQIF, VNRCF
Pigg River	VAW-L13R18R	Improvement	2007 - 2014	WQIF, VNRCF, RFP
Twittys and Ash Camp Creeks	VAC-L39R	Inadequate data	2007 - 2014	WQIF, VNRCF
Cub, Turnip and Buffalo Creeks	VAC-L36R, L37R, L40R	No data	2007 - 2014	WQIF, VNRCF
Flat, Nibbs, Deep and West Creeks	VAP-J08R, L09R, J11R	Improvement, Flat Creek identified for Success Story	2007 - 2014	WQIF, VNRCF
Moffett Creek, Middle River, Polecat Draft	VAV-B10, B13, B15	Some improvement	2007 - 2014	WQIF, VNRCF
Christians Creek and South River	VAV-B14, B30	Improvement	2007 - 2014	WQIF, VNRCF
Briery, Little Sandy, Spring, Saylers Creeks and Bush River	VAC-J02, J03, J04, J05 and J06R	Some improvement, 2014 Success Story	2007 - 2014	WQIF, VNRCF
Upper Bannister River	VAC-L65, L66, L68, L69	Too early	2012-2015	SRLEI

Aside from the 30 TMDL implementation projects that received funding in FY14, there are many implementation watershed areas that had received funding prior to FY14 and/or continued to implement agricultural BMPs funded through the DCR's Virginia Agricultural Cost-share Program:

Watershed Area	TMDL Segment	Status	Years of Implementation	Funds Used
Projects Past targeted funding from DCR (RFPs , VNRCF, etc); plus continuous funding thru 2014 from VACS				
Little Dark Run and Robinson River	VAN-E15R	Too early	2011-2014	WQIF RFP, CBLEI-TMDL, VACS
North Fork Holston River		Too Early	2014	VACS
Turley Creek and Long Meadow Run		Too Early	2014	VACS
Greenvale, Payne, & Beach Creeks		Too Early	2014	VACS
Nottoway River (Upper)	VASC-K14R	N/A	2005-2009	WQIF, VNRCF
Abrams and Opequon Creeks	VAV-B08R, B09R	N/A	2006 - 2011	WQIF, VNRCF
Upper Clinch River	VAS-P01R	Inadequate data	2007 - 2012	WQIF, VNRCF
Bluestone River	VAS-N36R	Some improvement	2007 - 2012	WQIF, VNRCF

Watershed Area	TMDL Segment	Status	Years of Implementation	Funds Used
Eleven projects received 5-7 years of continuous funding from 319(h) administered by DCR. These projects are no longer receiving TMDL funds, but may continue to receive funding from other sources. [e.g. VA Agricultural Cost-Share program (VACS) thru 2014]				
Middle Fork Holston River	VAS-O05R	Success Story 2005, 2013, 2014	2001-2008,	§319(h)
Upper Blackwater	LAW-L08R	Some improvement	2001-2007	§319(h)
North River	VAN-B21-22R, B27R, B29R	Muddy Creek delisted for nitrate-N 2010, Success story 2012	2001-2008	§319(h)
Holmans Creek	VAV-B45R	Some improvement	2005-2008	§319(h)
Catoctin Creek	VAN-A-02R	Some improvement	2005-2009	§319(h)
Cooks Crk & Blacks Run	VAV-B25R, B26R	Some improvement	2006-2012	§319(h), WQIF RFP,NFWF
Mill and Dodd Creeks	VAW-N20R, N21R	None reported	2007-2011	§319(h) & VNRCF
Little and Beaver Creeks	VAS-O07	None reported	2007-2012	§319(h), VNRCF, RFP
Big Otter River	VAW-L23R, L25R, L27-28R	Some improvement, segment delisted 2008	2006-2013	§319(h), VNRCF, RFP
Hawksbill and Mill Creeks	VAN-B38R, B39R	None reported	2008-2013	§319(h),VNRCF
Lower Blackwater River & Maggodee Creek		Some improvement	2008-2013	§319(h),
Federal EPA Nonpoint Source Implementation Grant (319h); Watershed Improvement Fund Request for Proposals (WQIF RFP), State Virginia Natural Resources Commitment Fund (VNRCF), National Fish and Wildlife Foundation (NFWF)				

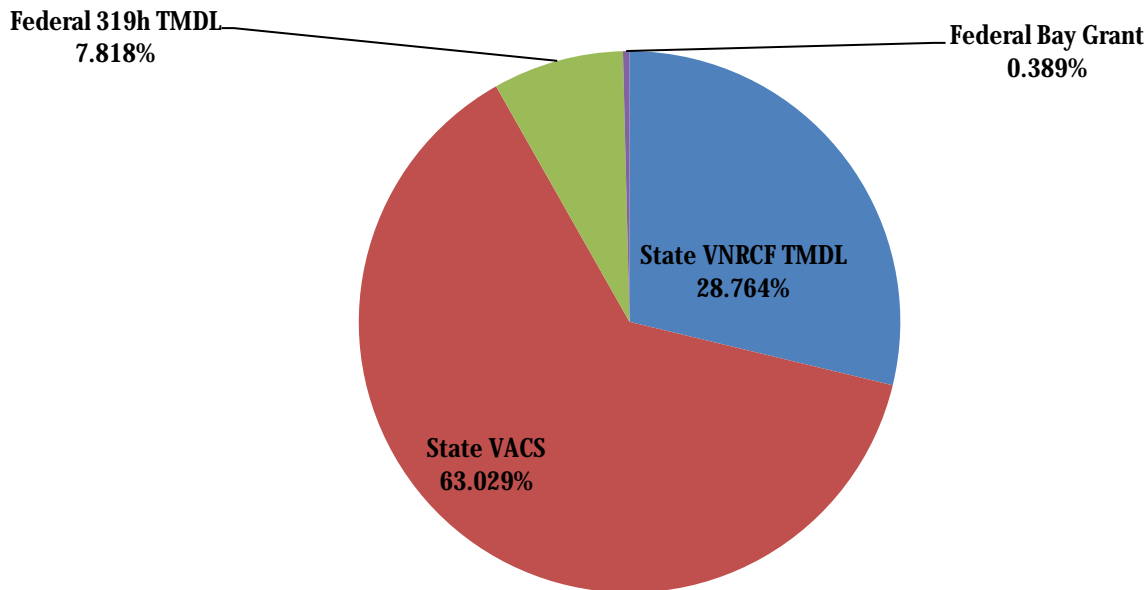
Funding of Implementation

As the agency taking the lead in nonpoint TMDL watershed implementation during FY14, DEQ utilizes both federal 319(h) funds to pay for DEQ regional staff to provide project management and technical support to watershed stakeholders to implement these projects. As a match to Federal 319(h) funds, DCR provides state general funds for operational support of the 47 soil and water conservation districts, which provide technical assistance with the design and installation of agricultural BMPs in TMDL implementation areas. In addition, Virginia runs a comprehensive cost-share program for BMP implementation utilizing both federal (319(h) and Chesapeake Bay Implementation Grant - CBIG) grants and state resources (from the Water Quality Improvement Fund, the Virginia Natural Resources Commitment Fund for TMDLS and the general state-funded Virginia Agricultural Cost-Share, VACS, program). A summary of TMDL cost share funds spent in FY2014 is provided in Tables I-3, I-4 I-5, and Figure I-4.

Table I-3: Summary of Funding for BMP implementation in TMDL Watershed areas July 2013 – June 2014

Funding Source	\$ of Cost-share Paid	\$ of Landowner contribution/match
State VNRCF TMDL	\$ 2,089,538	\$515,958
State VACS	\$ 4,578,618	\$5,659,695
Federal 319(h) TMDL	\$ 567,941	\$ 311,453
Federal Bay Grant Stream Exclusion (SL-6)	\$ 28,237	\$ 89,785
TOTAL	\$7,449,623	\$6,576,891
Chesapeake Bay Waters	\$ 4,009,731	\$ 4,443,940
Southern Rivers (Non-Chesapeake Bay)	\$ 3,254,604	\$ 2,132,951

**Distribution of Funding for BMP Installation in TMDL
Implementation Project Areas
July 2013 through June 2014**

**Figure I-4: Distribution of Funding for BMP Installation in TMDL Areas by Type of Funding in VA FY2014**

BMP Implementation and Pollution Reductions

Tracking both BMP implementation and water quality improvements in TMDL watersheds is critical in measuring success within the TMDL program. BMPs are effective and practical ways to prevent or reduce pollution from nonpoint sources to ensure water quality. While DCR has a highly effective BMP tracking program in place to account for BMPs installed using state or federal cost share funds, tracking BMPs installed voluntarily (without government assistance) has proven challenging. DCR is currently developing a mechanism by which

voluntary practices can be accounted for; however, BMP implementation and associated pollutant reductions reported to date are largely practices installed with government cost share funds.

Table I-4 describes the BMPS installed, Table I-5 shows associated pollutant reductions by BMP funding source, Table I-6 provides a summary of BMPs installed in targeted TMDL project areas in FY2014, and Table I-7 breaks down BMP implementation and pollution reductions by TMDL

watershed. An additional break down of BMP implementation by project area can be found in Chapter 2 for specific TMDL Implementation projects.

From January 1, 2013 thru June 30, 2014 there were 44 implementation plan watershed where 855 TMDL BMPs were installed. Of these projects, there were 27 active implementation projects supported by federal EPA §319(h) funding and/or state TMDL funding.

Collectively these projects spent \$2,\$2,657,480 of cost-share funds implementing 379 agricultural and residential BMPs. This included 289 BMPs funded with 319(h) and 90 BMPs funded through state VNRCF. This implementation resulted in over 685,463 feet of stream exclusion, and the reduction of 1.699+16 colony forming units (CFU) of fecal coliform bacteria, 60,405 pounds of nitrogen, 10,950 pounds of phosphorous, and 10,740 tons of sediment.

Table I-4. Summary of BMP Implementation for TMDL Projects from 7/1/13-6/30/14

Practice	Practice Description	Units	# of BMP	Extent of BMP Installed
FR-1	Aforestation of erodible crop and pastureland	Acres	9	57
FR-3 (CRFR-3)	Woodland/Forest buffer filter area/Planting	Acres	24	65
LE-1T	Livestock Exclusion with Riparian Buffers for TMDL Imp.	Lin. Feet	47	168,394
LE-2/LE-2T	Livestock Exclusion with Reduced Setback	Lin. Feet	19	25,671
NM-3B	Manure Application to Corn Using Pre-app. Nitrate Test	Acres	32	1,493
RB-1	Septic Tank Pumpout	Count	210	220
RB-3	Septic Tank System Repair	Count	28	28
RB-4	Septic Tank System Replacement	Count	20	20
RB-4P	Septic Tank System Installation/Replacement with Pump	Count	6	6
RB-5	Installation of Alternative Waste Treatment System	Count	5	4
SL-1	Permanent Vegetative Cover on Cropland	Acres	15	263
SL-6/SL-6T (CRSL-6)	Stream Exclusion With Grazing Land Management	Lin. Feet	151	478,451
SL-7/SL7-T	Extension of CREP Watering Systems	Acres	6	275
SL-8B	Small Grain cover crop for Nutrient Management	Acres	229	9,328
SL-9	Grazing Land Management	Acres	2	136
SL-10T	Pasture Management	Acres	3	377
SL-11	Permanent vegetative cover on critical areas	Acres	6	15
WP-2/WP-2T (CRWP-2)	Streambank protection	Lin. Feet	4	8,883
WP-2A	Streambank Stabilization	Lin. Feet	1	-
WP-4	Animal waste control facilities	Count	14	14
WP-4B	Loafing lot management system	Count	5	5
WQ-11 (CRWQ-11)	Agricultural Sinkhole Protection	Acres	1	1
WQ-4	Legume cover crop	Acres	18	713
Grand Total			855	n/a
Total of Linear Feet of Stream Exclusion or Streambank protection		Lin. Feet	221	681,398

Table I-5. Summary of Pollutants Reduced from 7/1/2013 - 6/30/2014 through TMDL Implementation

Data	Federal 319(h)	State VNRCF	State VACS	Federal CBIG	Grand Total
Number of BMPS Installed	289	90	461	15	855
Total Pounds Nitrogen Reduced	14,787	45,618	395,368	3,361	459,134
Total Pounds Phosphorus	1,904	9,046	82,262	628	93,840
Total Tons Sediment Reduced	2,354	8,386	72,678	618	84,036
Total of Bacteria Reduced	4.00E+15	1.30E+16	2.36E+16	4.67E+14	4.10E+16

Table I-6 Summary of cost-share funds spent on implementation by watershed: July 2013 – June 2014

TMDL Implementation Project	# of BMPs	Amount of Cost-share Paid (combined Federal and State funding)	\$ Match
Beaver Creek and Little Creek	4	\$ 37,802	\$ -
Big Otter River Watershed	16	\$ 516,868	\$ 527,824
Bluestone River	1	\$ 31,475	\$ 1,326
Carter Run, Great Run, Deep Run and Thumb Run	26	\$ 603,687	\$ 671,770
Catoctin Creek	2	\$ 13,736	\$ 3,676
Christians Creek and South River Watersheds	26	\$ 207,455	\$ 158,443
Cooks Creek and Blacks Run	13	\$ 53,402	\$ 62,455
Craig Run, Marsh Run and Browns Run	16	\$ 48,536	\$ 13,351
Cub Creek, Turnip Creek, Buffalo Creek and UT to	6	\$ 65,377	\$ 20,629
Dodd Creek and Mill Creek	1	\$ 7,550	\$ -
North River Watershed (Dry River, Mill and Pleasant	32	\$ 25,733	\$ 75,461
Falling River	21	\$ 355,720	\$ 162,040
Flat, Nibbs, Deep and West Creeks	31	\$ 335,457	\$ 369,083
Greenvale and Beach Creeks	9	\$ 21,533	\$ 15,379
Guest River	39	\$ 44,813	\$ 17,690
Hawksbill Creek and Mill Creek	2	\$ 342	\$ 52,826
Hays and Moffatts Creeks	12	\$ 168,778	\$ 91,839
Holmans Creek	4	\$ 133,229	\$ 222,416
James River (Slate River) Watershed	14	\$ 105,278	\$ 73,279
Knox Creek and Pawpaw Creek	6	\$ 9,613	\$ 3,413
Lewis Creek	2	\$ 61,310	\$ 61,474
Looney Creek	14	\$ 241,113	\$ 170,483
Lower Banister River Watershed	12	\$ 326,877	\$ 228,371
Lower Blackwater River, Maggodee and Gills Creek	4	\$ 79,492	\$ 1,229
Middle Fork Holston River Watershed	68	\$ 259,619	\$ 108,480
Middle River, Polecat Draft and Moffett Creek	35	\$ 390,994	\$ 597,276
Moore's Creek	9	\$ 13,329	\$ 5,857
Mossy Creek, Naked Creek and Long Glade Run	41	\$ 325,440	\$ 400,064
North and South Mayo River and Smith River	19	\$ 430,634	\$ 451,590
North Fork Holston River Watershed	32	\$ 391,923	\$ 162,652
Opequon Creek Watershed	11	\$ 261,454	\$ 275,315
Pigg River and Old Womans Creek Watersheds	15	\$ 372,902	\$ 139,364
Robinson River, Little Dark Run	9	\$ 76,335	\$ 46,023
Rockfish River Watershed	27	\$ 33,680	\$ 43,077
Smith Creek Watershed	104	\$ 173,588	\$ 292,951
Spout Run and Page Brook	1	\$ 39,000	\$ 39,000
Spring Creek, Briery Creek, Bush River, Little Sandy River and Saylers Creek	16	\$ 182,651	\$ 173,181
Turley Creek and Long Meadow Run	15	\$ 13,212	\$ 12,134
Twittys and Ash Camp Creeks	1	\$ 9,846	\$ 16,410
Upper Banister River Watershed	8	\$ 198,646	\$ 172,257
Upper Hazel River	51	\$ 153,118	\$ 164,935
Upper Nottoway River Watershed	10	\$ 54,137	\$ 58,204
Upper York River Basin	52	\$ 289,231	\$ 271,509
Willis River Watershed	18	\$ 99,420	\$ 142,158
Total	855	\$7,264,335	\$6,576,891

Table I-7: Summary of BMPs Installed in Watershed by funding source from July 2013 - June 2014

Implementation Plan Watershed	State VNRCF	State VACS	Federal 319(h)	Federal CBIG	Grand Total
Beaver Creek and Little Creek		4			4
Big Otter River Watershed		16			16
Bluestone River		1			1
Carter Run, Great Run, Deep Run and Thumb Run	5	12	9		26
Catoctin Creek		2			2
Christians Creek and South River Watersheds	5	21			26
Cooks Creek and Blacks Run		13			13
Craig Run, Marsh Run and Browns Run	3	7	6		16
Cub Creek, Turnip Creek, Buffalo Creek and UT to Buffalo Creek	1	5			6
Dodd Creek and Mill Creek		1			1
North River Watershed (Dry River, Mill and Pleasant Creek)		32			32
Falling River	8	13			21
Flat, Nibbs, Deep and West Creeks	7	21		3	31
Greenvale and Beach Creeks		9			9
Guest River	2		37		39
Hawksbill Creek and Mill Creek		2			2
Hays and Moffatts Creeks	2	8	2		12
Holmans Creek		3		1	4
James River (Slate River) Watershed		1	13		14
Knox Creek and Pawpaw Creek			6		6
Lewis Creek	1	1			2
Looney Creek	2	4	8		14
Lower Banister River Watershed	8	4			12
Lower Blackwater River, Maggodee and Gills Creek		4			4
Middle Fork Holston River Watershed		68			68
Middle River and Moffett Creek	3	31		1	35
Moore's Creek			9		9
Mossy Creek, Naked Creek and Long Glade Run	4	33			37
North and South Mayo River and Smith River Watersheds	5	14			19
North Fork Holston River Watershed		32			32
Opequon Creek Watershed	1	10			11
Pigg River and Old Womans Creek Watersheds	10	5			15
Polecat Draft		4			4
Robinson River, Little Dark Run		9			9
Rockfish River Watershed			25	2	27
Smith Creek Watershed		23	79	2	104
Spout Run and Page Brook		1			1
Spring Creek, Briery Creek, Bush River, Little Sandy River and Saylers Creek	5	7		4	16
Turley Creek and Long Meadow Run		15			15
Twittys and Ash Camp Creeks		1			1
Upper Banister River Watershed	6	2			8
Upper Hazel River	9	3	39		51
Upper Nottoway River Watershed	1	9			10
Upper York River Basin	4	6	42		52
Grand Total	90	461	289	15	855

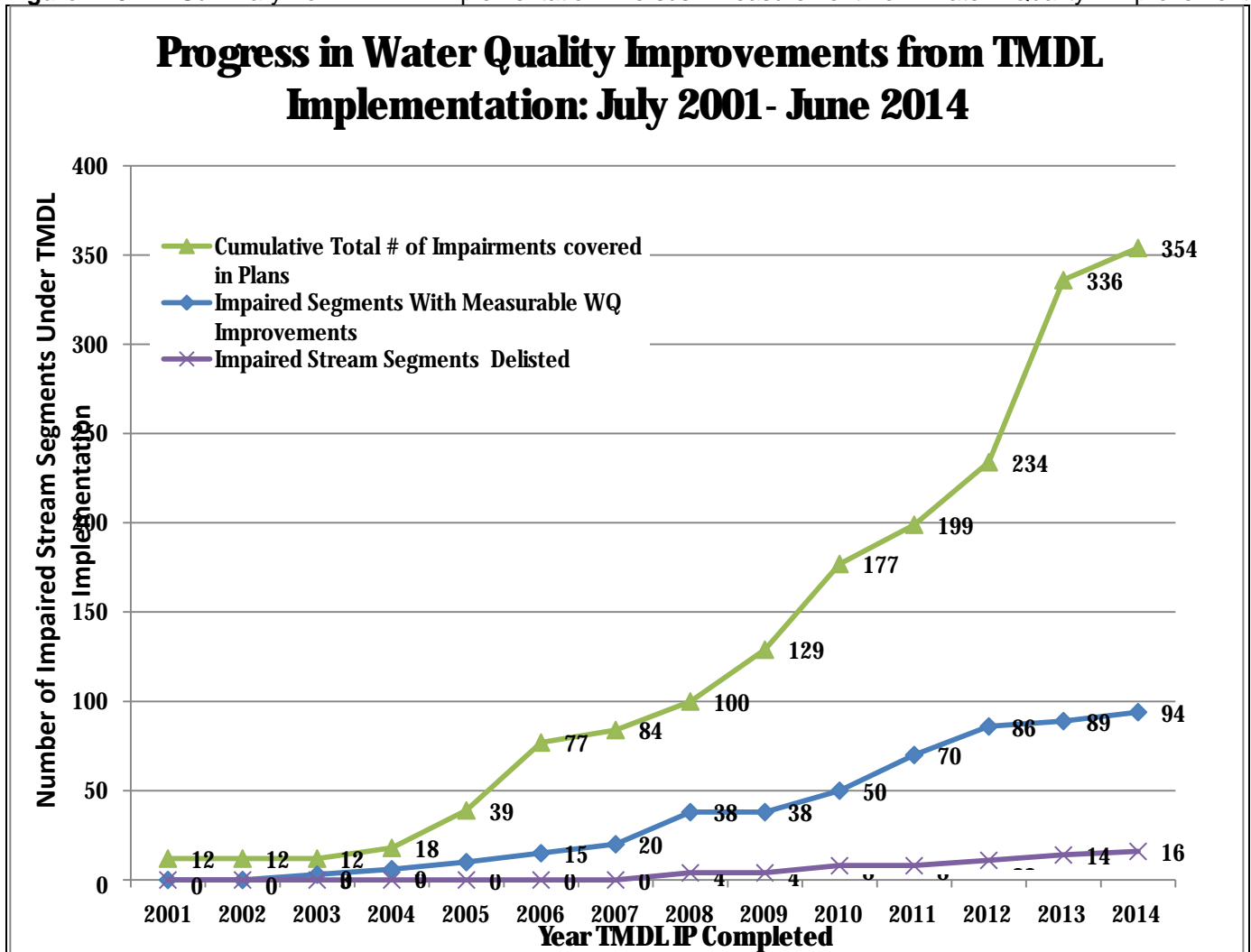
Water Quality Improvements, Watershed Restoration, Delisting and Future Actions

Translating TMDLs developed at an ambitious pace into actual water quality improvements is a growing challenge in the TMDL program. Virginia has been implementing TMDLs using existing nonpoint source programs and funding sources despite inadequacies in staffing and funding to handle the volume of TMDLs. Existing resources include regulatory permitting programs from DEQ, DCR and DMME that limit discharges to state waters. These programs are utilized when stream impairments are attributed to a permitted facility. For non-permitted activities, Virginia's approach has been to use incentive-based programs such as the Virginia Agricultural Cost Share Program and Section 319 grant funds. Virginia also

offers grant funding for the implementation of BMPs and for technical assistance funding in watersheds with approved implementation plans.

Despite the challenges in attaining water quality standards, Virginia's TMDL program has shown that properly applied and maintained best management practices can result in measurable improvements in water quality (Figure I-5). Virginia's natural resource agencies will continue to engage and work with watershed communities to restore their local rivers and streams using existing programs and resources, and exploring innovative ideas and funding strategies for the future.

Figure I-5. Summary of TMDL Implementation versus Measurement of Water Quality Improvement



Virginia Success Stories

Success of Virginia's TMDL Implementation Program can also be shown through the number of project areas that have shown improving water quality conditions or have been delisted from Virginia's 303(d) list of impaired waters. A number of these project areas have been accepted [National NPS Success Stories](#) by EPA Headquarters. Through [Section 319 Nonpoint Source Success Stories](#), EPA tracks the progress of partially or fully restoring waterbodies associated with NPS implementation actions.

Since 1997 Virginia's Nonpoint Source Management Program and associated TMDL Implementation Program has written and submitted to either EPA headquarters or EPA Region 3 NPS Branch, twenty-one success stories documenting success in restoring or improving water conditions. These stories are classified into three types: Type 1 stories are related to partial or full restoration (delisting of impairments), Type II indicates significant water quality improvement, and type 3 indicates ecological restoration or improvements.

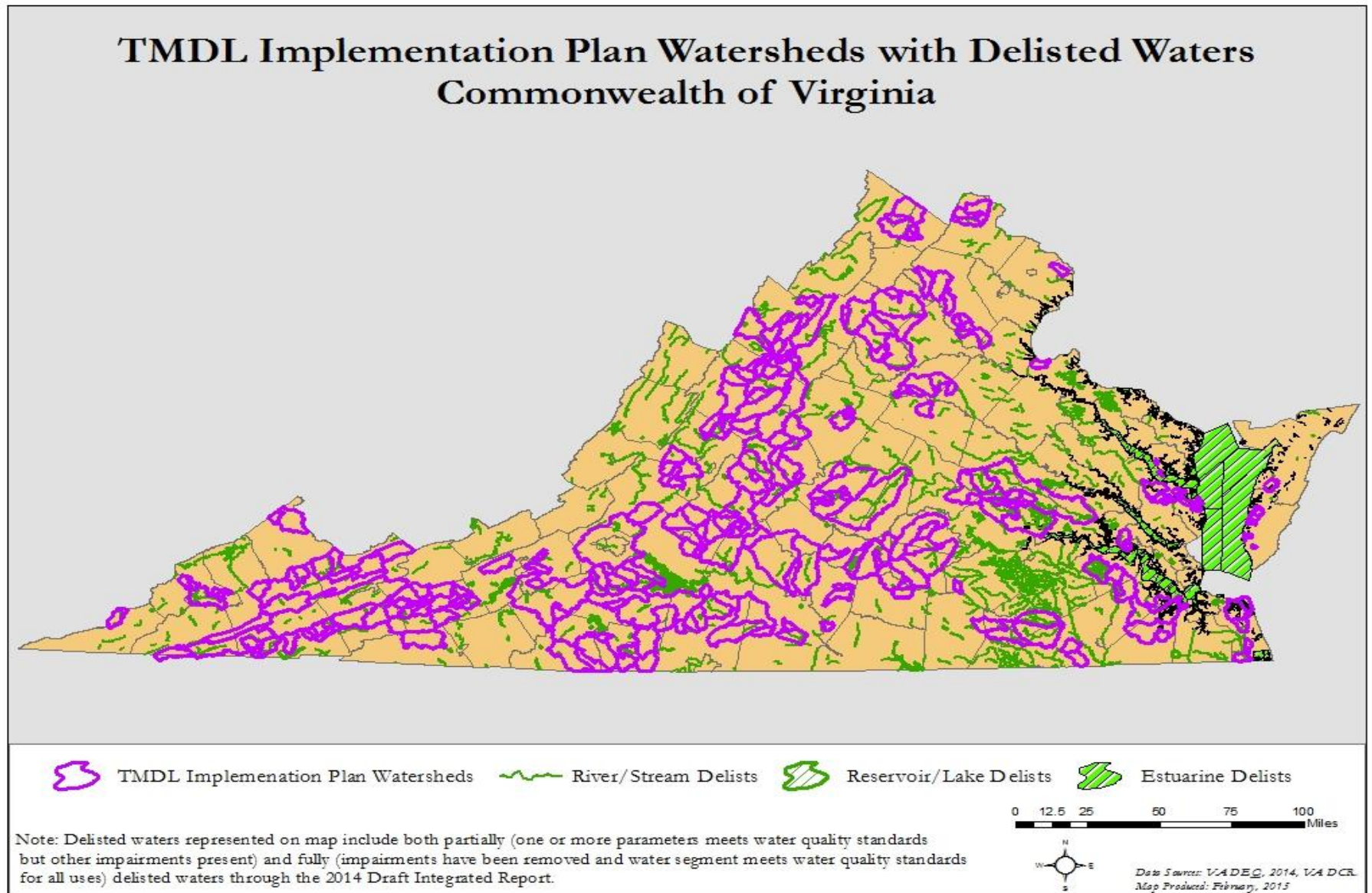
Table I-8: Virginia Success Stories 1997-2014

<i>Type</i>	<i>Name of Success Story</i>	<i>Year</i>	<i>Topic</i>
3 (R3&HQ)	Lower Powell- Riparian Restoration & Karst Conservation	1997	Karst Protection Program
3 (R3&HQ)	Middle Fork Holston – Alternative Watering Systems	1997	TMDL Implementation
3 (R3)	Shenandoah and Potomac Rivers	2001	Tributary Strategy
2 (R3&HQ)	Cabin Branch Mine Orphaned Land Project	2002	Mining
2 (R3&HQ)	Toncræ Mine Orphaned Land Project	2002	Mining
2 (HQ)	Middle Fork Holston River (Three Creeks)	2005	TMDL Implementation
2 (HQ)	Muddy Creek and Lower Dry River	2006	TMDL Implementation
2 (R3)	Muddy Creek and Lower Dry River	2006	TMDL Implementation
1 (HQ)	Batie Creek	2007	Karst Program
1 (HQ)	Lynnhaven, Broad and Linkhorn Bays	2008	Shellfish
2 (R3)	Valzinco Mine Orphaned Land Project	2008	Mining
1 (HQ)	Willis River	2010	TMDL Implementation
1 (HQ)	Middle Creek	2011	Mining
2 (HQ)	Black Creek	2011	Mining
1 (HQ)	Muddy Creek	2012	TMDL Implementation
2 (HQ)	Carter Run	2013	TMDL Implementation
1 (HQ)	Clinch River (submitted)	2013-2014	TMDL Implementation
1 (HQ)	Cub Creek (submitted)	2013-2014	TMDL Implementation
2 (HQ)	Flat Creek	2013	TMDL Implementation
2(HQ)	Middle Fork Holston River (submitted)	2013-2014	TMDL Implementation
1(HQ)	Byers and Hutton Rivers (submitted)	2014	TMDL Implementation

Figure I-6: Virginia Success Story Locations 2000-2014



Figure I-7: Statewide Implementation Plan Watersheds with Delisted Waters (all Integrated Report Cycles)



CHAPTER 2: *Progress Reports for TMDL Implementation Projects*

This chapter provides annual and comprehensive summaries of the following TMDL implementation projects:

Federal Section 319(h) TMDL Implementation Projects – Closeout Reports: These projects received targeted 319(h) and some projects have received supplemental state funding. For projects 1 and 2, Targeted TMDL Funding stopped prior to June 30, 2013; however state funded Virginia Agricultural Cost-share funding continued thru June 30, 2014. For projects 3 and 4 targeted funding from 319(h) continued through June 2014. These closeout reports describe the accomplishments to date and provide a justification of why targeted TMDL funding has stopped for these projects. These projects addressed agricultural, residential septic and in some cases pet waste and urban BMP activities.

- 1) Big Otter River Project: July 2006 – December 31, 2013
- 2) Mill and Hawksbill Creeks Project: January 2008 - June 30, 2013
- 3) Lower Blackwater River, Maggoe and Gills Creek December 2012

Federal Section 319(h) TMDL Implementation Projects – Current Projects: These projects address agricultural, residential septic, urban BMP activities. These projects are funded mainly with Federal 319(h) but some projects have received supplemental state funding from either the Water Quality Improvement Fund or the Virginia Natural Resources Commitment Fund

- 1) Looney Creek Project: July 2009 - June 2014
- 2) Moores Creek Project: January 2012 - June 2014
- 3) Upper Hazel River Project: July 2009 - June 2014
- 4) Thumb, Deep, Carter and Great Runs Project: July 2006 - June 2014
- 5) Willis River Project: July 2005 - June 2014
- 6) Slate River Project: July 2011 - June 2014
- 7) Smith Creek Project: January 2012 - June 2014
- 8) Craig, Brown and Marsh Runs Project: January 2012 - June 2014
- 9) Hays Creek Project: October 2012-June 2014
- 10) Upper York River Project: October 2012-June 2014

Other Implementation Projects: These projects have no 319(h) funding, they are implementing a TMDL IP with different sources of state funds, but also have received WQIF Targeted TMDL funding.

- 1) Robinson River and Little Dark Run TMDL Implementation Project

WQIF Targeted TMDL Implementation Projects: These projects are exclusively funded by State WQIF resources to address agricultural BMPs. All projects started around July 2006 and were still active through June 2013.

- 1) Christians Creek and South River TMDL Implementation Project
- 2) Moffett Creek, Middle River and Polecat Draft TMDL Implementation Project
- 3) Mossy Creek, Long Glade Run and Naked Creek TMDL Implementation Project
- 4) Falling River TMDL Implementation Project
- 5) Pigg River TMDL Implementation Project (Blue Ridge SWCD)
- 6) Flat, Nibbs, Deep and West Creeks TMDL Implementation Project
- 7) Spring, Briery and Saylers Creeks, Little Sandy and Bush Rivers TMDL Implementation Project
- 8) Cub Creek TMDL Implementation Project (Appomattox County portion only)
- 9) Southern Rivers Livestock Exclusion TMDL Project (Halifax, Pittsylvania and Patrick SWCDs)

Closeout Report: Big Otter River TMDL Implementation Project: July 2006 – December 2013

Project Location

The Big Otter River Basin (BOR) is located in Bedford and Campbell counties, Virginia, and includes the City of Bedford and the suburbs of the City of Lynchburg. There are 267 miles of stream in the 388 mi² basin. The Big Otter River is a tributary of the Roanoke River, which empties into Buggs Island Lake, Lake Gaston and eventually the Albemarle Sound in North Carolina. The Big Otter River was placed on Virginia's 303(d) list of impaired waters in 1998 for violating the water quality standard for fecal coliform bacteria. DEQ completed a TMDL for the watershed in 2000. Eight subwatersheds are included in the project area: Sheep Creek, Elk Creek, Machine Creek, Little Otter River, Lower Big Otter River, North Otter Creek, Buffalo Creek (Falling & Elk Creeks), and Flat Creek. The latter 3 watersheds contain no impairments, but are included because they drain directly to the project area and contribute to the pollution load.

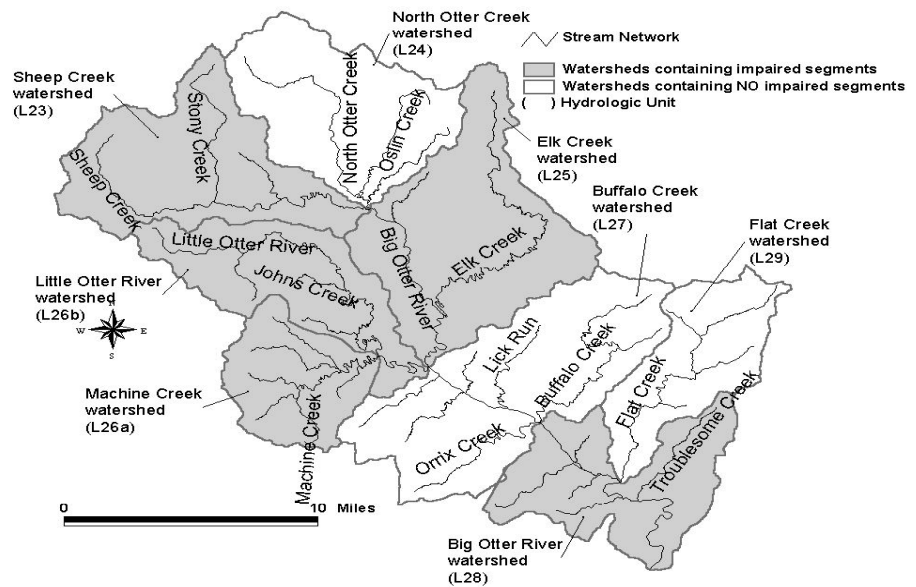


Table II-1: Big Otter River BMP Summary: July 2006-December 2013

Control Measure*	Unit	Total	Installed	%
Agricultural				
Stream Exclusion Fencing	Feet	934,560	479,797	51
Riparian Buffer Established	Acre		642	
Livestock Exclusion System	System	270	189	70
Forest Buffer	Acre	39	239	16
Animal Waste Control		5	4	125
Pasture Management	Acre	7,001		
Residential				
Septic Pump Out	System		27	
Connection to Sewer	System		23	
Septic System Repair	System	34	28	82
Septic System Installation	System	10	92	100
Alternative Waste Treatment System	System	26	8	31
*NOTE: BMPs funded by State CS, CREP or 319 are included				
Water Quality Goals Met	Unit	Miles Listed	Miles Delisted	%
Impaired miles on 303(d) list	Miles	76.78	-	-

Implementation Highlights

From July 2006 through December 2013, the Peaks of Otter Soil & Water Conservation District (POSWCD) administered the Big Otter TMDL Implementation Project. A total of 251 agricultural BMPs were installed including 189 stream exclusion systems resulting in 91 miles of stream exclusion fencing. In addition, 178 residential BMPs were installed including 27 septic tank pumpouts, 28 septic system repairs, 23 connections to public sewer, 92 septic system replacements/installations, and eight alternative waste treatment systems. The pollution reductions as a result of the BMPs installed included below are only for 319(h) funded practices

Table II-2: Pollution Reductions for the Big Otter River: July 2006-December 2013

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
Project Total - July 2006-December 2013	1.12E+16	307,102	61,185	55,775

The total amount of cost-share provided to landowners during the project period totaled \$3,301,453 from both state and federal funding. State funding sources included Virginia Agricultural Cost-Share, Virginia Natural Resources Conservation Fund, and Water Quality Improvement Fund (2,169,592). Federal 319 funds provided \$1,131,861 in cost-share funding and \$371,938 in technical assistance funds for POSWCD staff to administer the agricultural and residential programs in the Big Otter project area. Total project funding was \$3,673,391.

Summary of Water Quality Monitoring

Bimonthly bacteria monitoring results for the Big Otter River, monitoring station (4ABOR000.62), during the period of 2003–2013 did not demonstrate water quality improvements. Plotting the violation rate of the single sample maximum criterion of 235 cfu/100 mL overtime demonstrated that there was an actual upward trend in the violation of the criterion. Monitoring in Little Otter River, monitoring station (4ALOR000.62), over the 2003-2013 period demonstrated water quality was basically unchanged with a flat trend in violations of the single sample maximum criterion. Monitoring in Buffalo Creek, monitoring station (4ABWA002.00), during the 2003-2013 period indicated a slight downward trend in violations of the single sample maximum criterion.

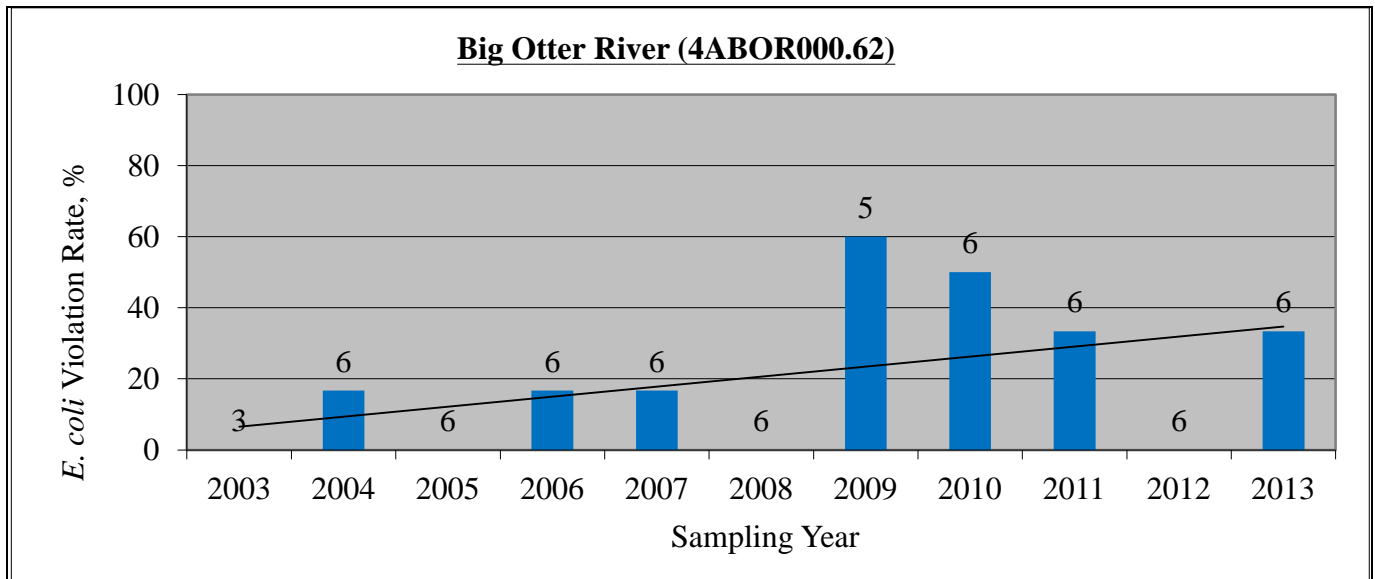


Figure II-1: Water Quality Data for Big Otter River, site 4ABOR000.62

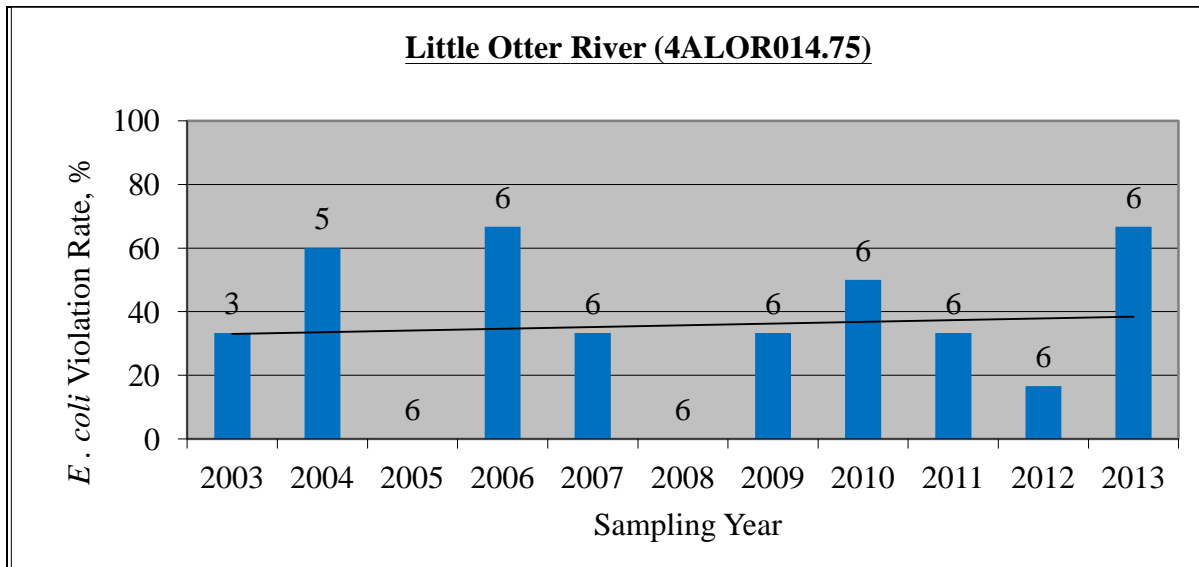


Figure II-2: Water Quality Data for Big Otter River, site 4ALOR014.75

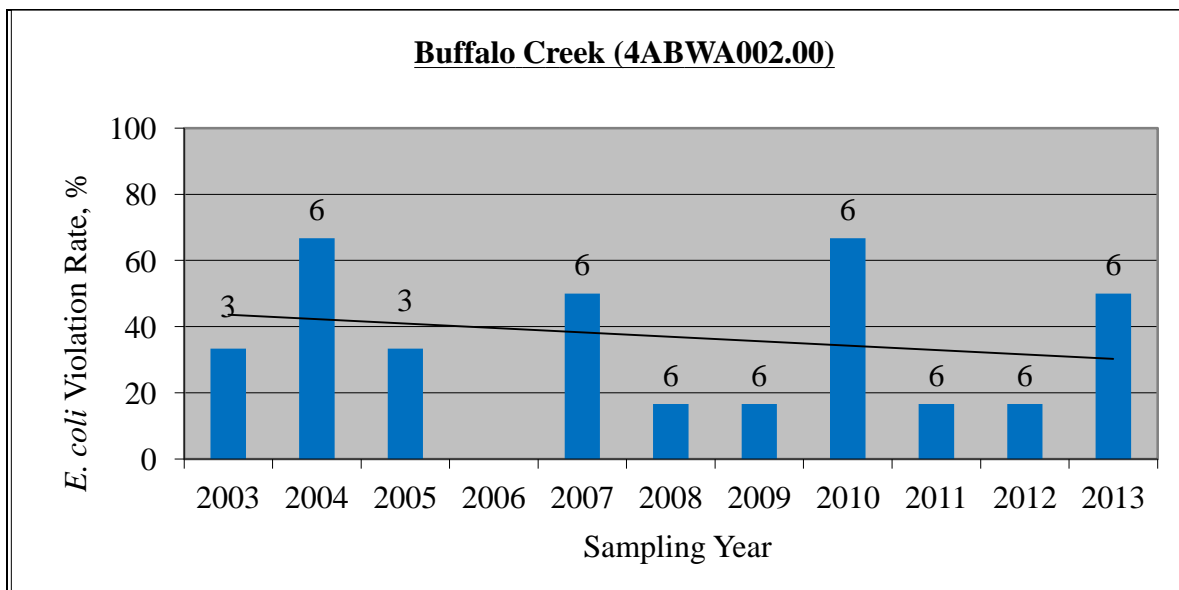


Figure II-3: Water Quality Data for Big Otter River, site 4ABWA002.00

E. coli sampling data indicating violations of the 235 cfu/100 mL criterion on an annual basis. Number of samples collected annually is shown at top of each bar graph.

The Big Otter project period was 7 ½ years and DCR decided to discontinue targeted 319 funding to the Big Otter project area in December 2013 due to several reasons which included:

- Project had been active for 7 ½ years and over the project period had received federal 319 funds as well as state VNRCF funds totaling 3.67 million.
- Lack of cohesiveness and project support amongst partnering agencies, in particular between SWCD and NRCS.
- Limited water quality improvements for the impaired streams in the project area.

Closeout Report: *Mill and Hawksbill Creek TMDL Implementation Project: Jan 2008 - June 2013*



Project Location

Mill Creek and Hawksbill Creek are located in Page County in the South Fork Shenandoah watershed. Hawksbill Creek runs through the Town of Luray. Mill Creek watershed is 8,178 acres and Hawksbill Creek watershed is 56,951 acres. The creeks were listed as impaired on Virginia's 1998 303(d) *Total Maximum Daily Load Priority List and Report* (DEQ, 1998) due to violations of the water quality standard for fecal coliform (modified listing for *E. coli*). The impaired segment includes Mill Creek from the headwaters to the confluence with the South Fork Shenandoah River (6.78 miles) and Hawksbill Creek from its headwaters downstream to its confluence with the South Fork Shenandoah River (19.3 miles).

Implementation Highlights

The Mill and Hawksbill Creek TMDL implementation project was administered by the Shenandoah Valley Soil and Water Conservation District (SVSWCD). The table on the right shows overall BMPs implemented in the watersheds since the TMDL implementation project began in January 2008 compared to implementation goals for the project area. The residential septic program was a great success in Mill and Hawksbill Creeks, with the septic repair goal exceeded (88 repairs completed – IP goal was 57), and the number of septic system replacements surpassing 50% of the implementation goal. A total of 122 failing septic systems were repaired or replaced. Participation in the livestock exclusion BMPs was not overly embraced by local farmers even with increased cost-share (up from 75% to 85%) and a reduced setback BMP reducing the stream buffer minimal width from 35 feet to 10 feet. The state made both of these options available in January 2009 to farmers in TMDL implementation areas. Only 5.6 miles of stream fencing was installed which was 22% of the 26 mile goal in the implementation plan.

Table II-3: Mill and Hawksbill Creek BMP Summary: January 2008 – June 2013

Control Measure	Units*	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	F	138,828	29,667	22
Stream Exclusion Fencing	S	62	18	29
Riparian Buffer	Ac	---	89	---
Voluntary Exclusion Systems	S	24	0	0
Waste Storage Facility	S	8	3	38
Manure Incorporation	Ac	838	0	0
Pasture Management	Ac	14,739	0	0
Veg. Buffer on Cropland	Ac	9	148	
Urban/Residential				
Pet Litter Control Program	P	1	0.5	50
Pet Waste Digesters	S	1,577	4	<0
Vegetated Buffer	Ac	12	0	0
Residential Septic				
Septic Tank Pump Out	S	936	332	58
Septic System Repair	S	57	88	154
Septic System Installation	S	60	31	58
Alternative Waste Treatment	S	32	3	9

*Ac = Acres, S = System, F = Feet

Pollution reductions resulting from BMP installations during the project period of January 2008 through June 2013 are summarized in the table below.

Table II-4: Pollution Reductions for Mill and Hawksbill Creeks

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
Project Total - January 2008-June 2013	2.74+15	20,910	4,308	3,168

The total amount of cost-share provided to landowners during the project period totaled \$665,210 from both state and federal funding. State funding sources included Virginia Agricultural Cost-Share and Virginia Natural

Resources Conservation Fund (221,998). Federal 319 funds provided \$443,212 in cost-share funding and \$151,931 in technical assistance funds for SVSWCD staff to administer the agricultural and residential programs in the Mill and Hawksbill Creek project area. Total project funding was \$817,141.

The Mill and Hawksbill Creek project period was 5 ½ years and DCR decided to discontinue targeted 319 funding to the project in June 2012 due to several reasons which included:

- Turnover in staff hired into position as agricultural Conservation Specialist to work with farmers in project area occurred on two occasions.
- Local resistance to livestock stream exclusion based on flooding concerns and the amount of pasture that would be given up by setting fence lines outside floodplain, and maintenance and out-of-pocket costs to restore fencing. Most of the farmers considering livestock stream exclusion had already participated in the state cost-share program prior to targeted project funds becoming available.
- Water quality improvements based on bacteria monitoring were not evident in Hawksbill Creek, in fact water quality became more degraded. Mill Creek bacteria monitoring demonstrated improving water quality conditions.
- Residential program was very successful based on the number of septic system practices installed. Success is attributed to the relationship the SVSWCD formed with local septic contractors and the contractors communicating with homeowners that grant funds were available to repair and replace failing septic systems and to pump-out septic systems.

Summary of Water Quality Monitoring

Monthly bacteria monitoring results for Hawksbill Creek, monitoring station (1BHKS000.96), during the project period did not demonstrate water quality improvements. Plotting the violation rate of the single sample maximum criterion of 235 cfu/100 mL overtime demonstrated that there was an actual upward trend in the violation of the criterion. Monitoring in Mill Creek, monitoring station (1BMLC000.40) however demonstrated improving water quality with a downward trend in violations of the single sample maximum criterion. During the 2007-2012 water quality assessment period, 21 out of 72 bacteria samples collected from Mill Creek violated the single sample maximum - resulting in a 29% violation rate.

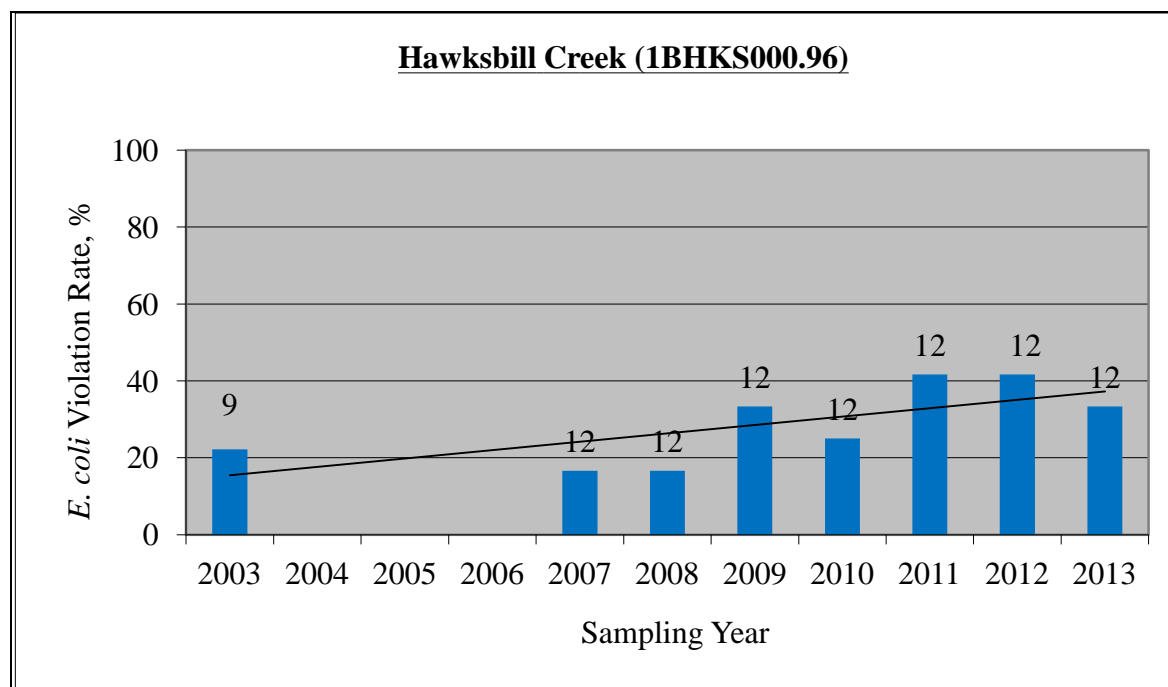


Figure II-4: Water Quality Data for Hawksbill Creek

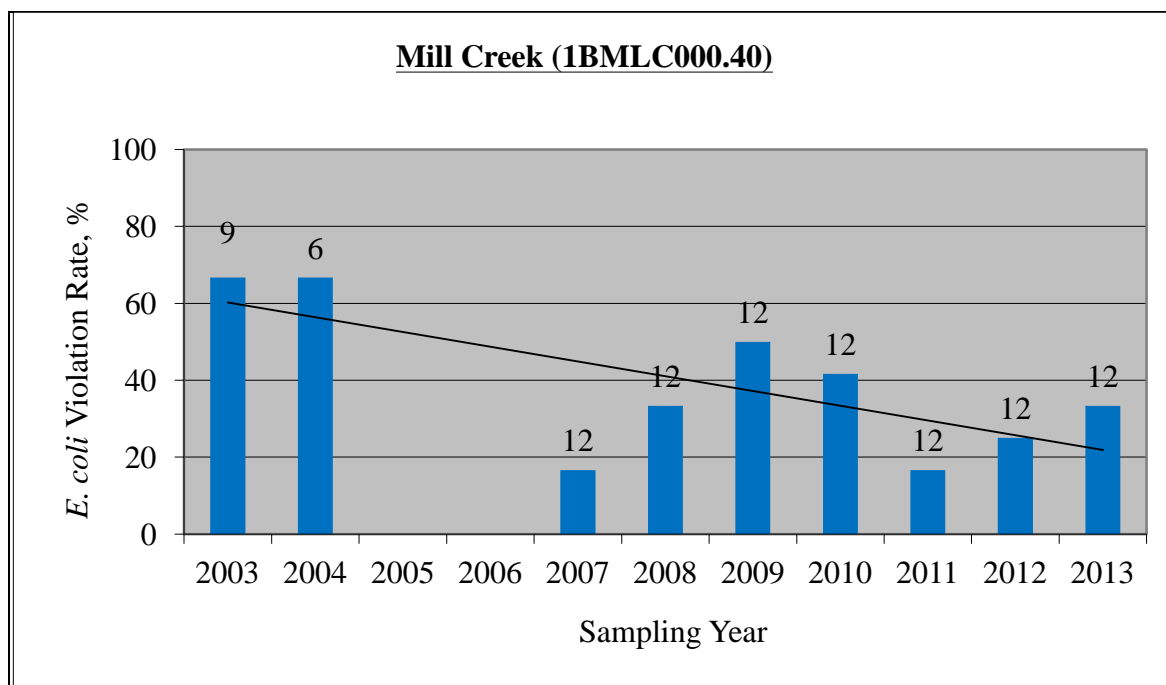


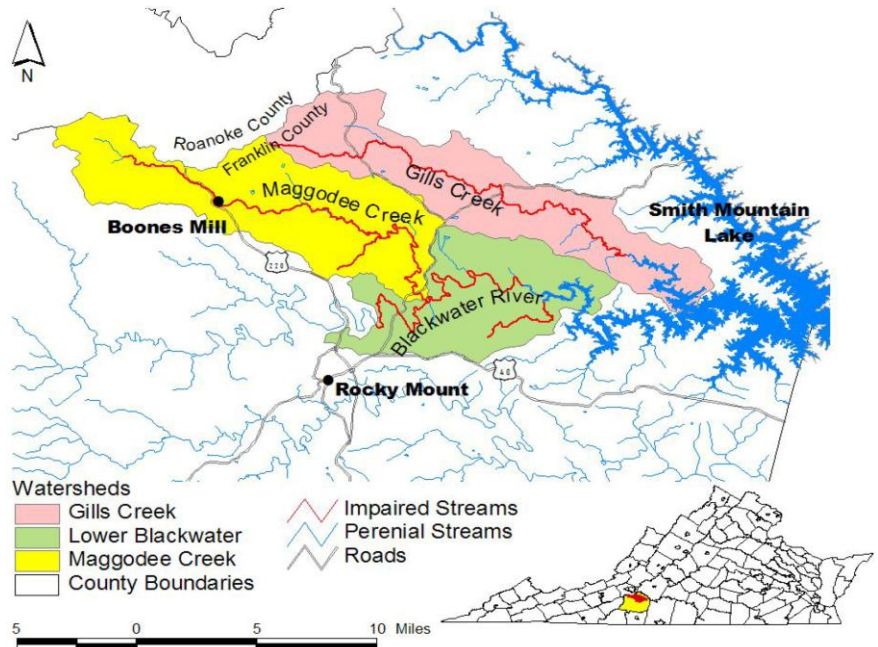
Figure II-5: Water Quality Data for Mill Creek

E. coli sampling data indicating violations of the 235 cfu/100 mL criterion on an annual basis. Number of samples collected annually is shown at top of each bar graph.

Closeout Report: Lower Blackwater TMDL Implementation Project: 2006-2012

Watershed Description and Water Quality Conditions

The Lower Blackwater River, Maggodee Creek and Gills Creek project area is located in Franklin County, Virginia (HUC 0301010). Gills Creek is impaired for fecal coliform in a 27.9-mile segment extending to the confluence with Smith Mountain Lake. Maggodee Creek watershed is dominated by forest (62%), agriculture (33%) and is impaired for *E. coli* along a 21.2 mile stretch extending to the confluence with the Blackwater River. The portion of the Blackwater River addressed in this report (referred to as the Lower Blackwater River) is impaired for 20 miles extending to the upper reaches of Smith Mountain Lake. Water from the Blackwater River and Gills Creek flows through Smith Mountain Lake, into the Roanoke River and eventually into the Albemarle Sound on North Carolina's coast.



Implementation Highlights

The Department of Conservation and Recreation and local stakeholders completed a TMDL implementation plan for the Lower Blackwater River, Maggodee Creek and Gills Creek in January 2006. An implementation project funded by 319(h) started in March 2006 lead by the Blue Ridge Soil and Water Conservation District. This project was closed and as of July 2012 is no longer receiving 319(h) funding.

The project was relatively successful in implementing agricultural BMPs with a total of 57 agricultural practices installed including 48 livestock exclusion systems (52% of goal) resulting in approximately 29 miles of stream fencing (103% of goal), and the establishment of 116 acres of riparian buffer. In addition 79 residential BMPs were installed including 68 septic tank pumpouts and 10 septic system repair or replacement. Implementation of residential practices was not as successful. The pollution reductions resulting from BMPs installed with 319(h) funded practices are as follows:

Table II-5: Lower Blackwater River BMP Summary: March 2006-June 2012

Control Measure*	Unit	Units Needed	# Installed	% of Goal %
Agricultural				
Stream Exclusion Fencing	Feet	147,840	151,907	103
Stream Exclusion Fencing	System	77	48	62
Riparian Buffer Established	Acre		116.52	
Waste Storage Facility	System		5	
Loafing Lot Management	System	3	2	66
Vegetative Cover on Critical Area	Acre		3	
Residential				
Septic System Pump Out	System	100	68	68
Connection to Public Sewer	System		1	
Septic System Repair	System		3	
Septic System Installation	System	65	7	10
Alternative Waste Treatment System	System	7		
Water Quality Goals Met				
	Unit	Miles Listed	Miles Delisted	%
Impaired miles on the 303(d) list	Miles	69.1	4.41	6

Table II-6: Pollution Reductions for the Lower Blackwater River, Maggodee Creek and Gills Creek: March 2006-June 2012

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
Project Total - March 2006 – June 2012	5.55E+15	77,053	15,207	14,081

The total amount of cost-share provided to landowners during the project period totaled \$1,126,308 from both state and federal funding. State funding sources included Virginia Agricultural Cost-Share and Virginia Natural Resources Conservation Fund (\$639,407). Federal 319(h) funds provided \$489,901 in cost-share funding and \$349,537 in technical assistance funds for BRSWCD staff to administer the agricultural and residential programs in the Lower Blackwater, Maggodee and Gills Creek project area. Total project funding provided was \$1,475,845.

The Lower Blackwater, Maggodee and Gills Creek project period was 6 ¼ years and DCR decided to discontinue targeted 319 funding to the project in June 2012 due to several reasons which included:

- Project had been active for 6 ¼ years and over the project period had received federal 319 funds as well as state funds.
- Low level of implementation for the residential septic system BMPs to remove straight pipes and correct failing septic systems.
- Agricultural program was highly successful in regards to total linear feet of stream fencing installed, met 103% of TMDL implantation plan goal, and number of livestock exclusion systems installed, met 62% of plan goal.
- Limited water quality improvements in the project area (only 4.4 stream miles out of 69 impaired stream miles had been de-listed as of June 2012).
- High expenditure of technical assistance funds for the amount of implementation dollars utilized (71 cent for each \$1 spend on implementation).
- The Blue Ridge SWCD had 12 years of continual 319 funding beginning with the Upper Blackwater project from 2001-2008 and Lower Blackwater from 2006-2012.

Summary of Water Quality Improvements

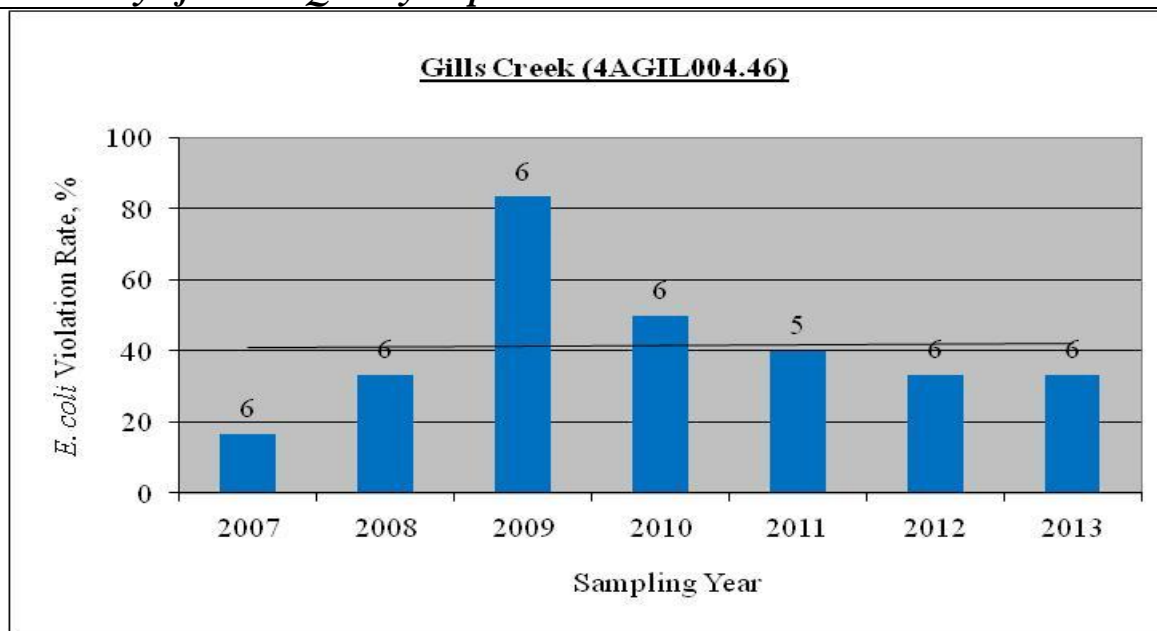


Figure II-6: Water Quality Data for Gills Creek

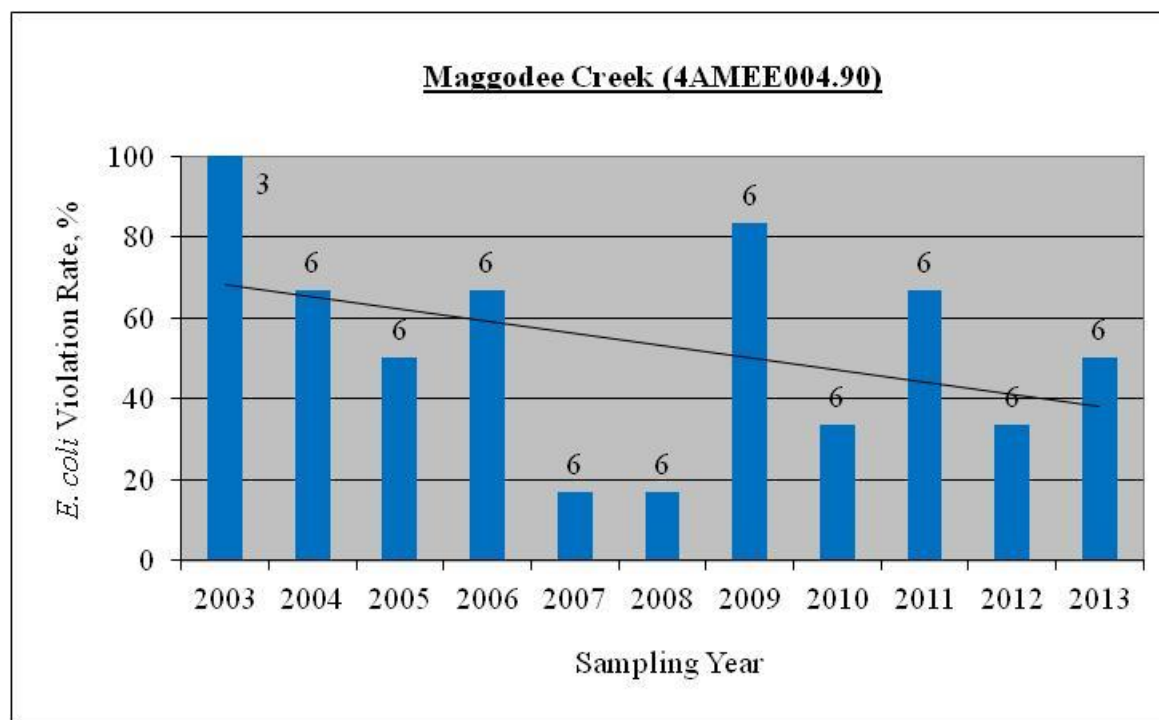


Figure II-7: Water Quality Data for Maggodee Creek

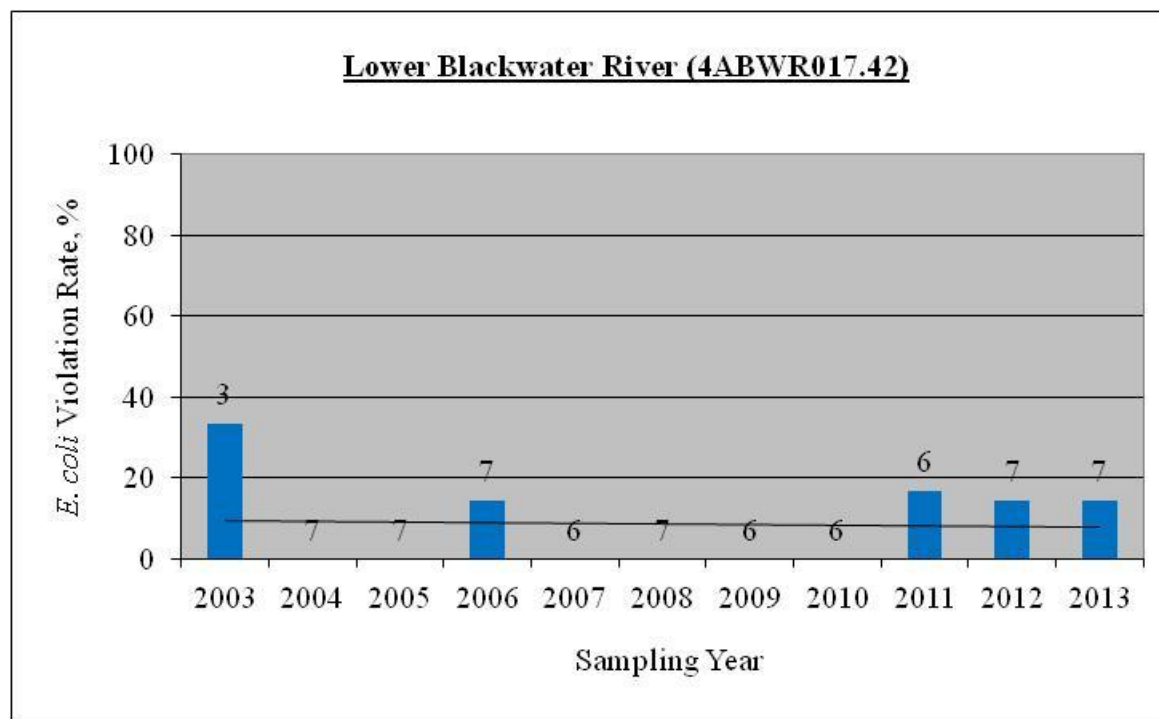
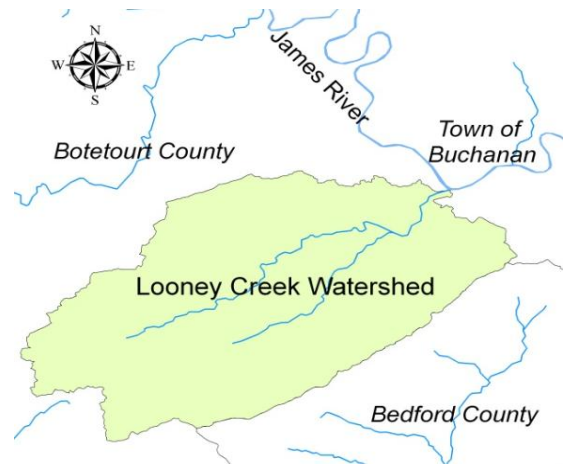


Figure II-8: Water Quality Data for Lower Blackwater River

Current 319H Project Report - Looney Creek TMDL Implementation Project: July 2009- June 2014

Project Location

Looney Creek is located in Botetourt County, Virginia. The creek empties directly into the James River south of the Town of Buchanan. The Looney Creek watershed is approximately 40,000 acres with an estimated population of just over 4,100 people. The major land use in this watershed is forest. Looney Creek was listed as impaired on Virginia's 1998 303(d) list due to violations of the State's water quality standards for fecal coliform bacteria from the confluence of Mill and Back Creek to the James River confluence, a total of 2.48 miles. The VA Department of Environmental Quality completed a bacteria TMDL for Looney Creek in May 2004, and DCR completed the TMDL implementation plan in November 2007.



Implementation Highlights

The Looney Creek TMDL implementation project is administered by the Mountain Castles Soil and Water Conservation District (MCSWCD). The table on the right shows BMPs implemented in the watershed since the project began in July 2009 and overall implementation goals for the project area. Landowner participation in the cost share program had been variable from year to year, with a considerable amount of livestock exclusion fencing going in between 2010 and 2011, and very little the following year. But, during July 2013- June 2014 period, livestock exclusion fencing installed has increased significantly compared to previous year.

During this July 2013- June 2014 period, six livestock exclusion practices were completed, including two livestock exclusion with riparian buffers and four stream exclusion with grazing land protection. These practices resulted in 15,246 linear feet of stream exclusion fencing. Also, 44 acres were placed under small cover crop for nutrient management. In addition, one septic tank pumpout, one septic system repair, and two septic system replacement were completed.

Table II-7: Looney Creek BMP Summary: July 2009 – June 2014

Control Measure**	Units*	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	F	68,583	46,474	68
Stream Exclusion Fencing	S	44	15	34
Riparian Buffer	Ac	----	22	----
Waste Storage Facility	S	2	1	50
Small Acreage Grazing	Ac	----	200	----
Extension of CREP Watering	F	-----	80	-----
Residential Septic				
Septic Tank Pump Out	S	100	17	17
Septic System Repair	S	16	8	50
Septic System Installation	S	77	8	10
Alternative Waste Treatment	S	10	2	20
Small Cover Crop for Nutrient Management	Ac	-----	44	-----

*NOTE: BMP counts after 7/1/2009 only include 319 funded projects. BMPs funded by State CS, CREP or Federal EQIP are not included after this date (though they may have been included previously) *Ac = Acres, S = System, F = Feet

Pollution reductions resulting from BMPs installation since 2009 are summarized in the table below.

Table II-8: Pollution Reductions for Looney Creek: July 2009-June 2014

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2013 – June 2014	6.65E+14	6,619	1,077	1,199
July 2009-June 2013	2.11 E+15	15,389	2,315	953

The Virginia Department of Environmental Quality (DEQ) monitors the water quality in Looney Creek and its tributaries at several stations through the agency's ambient monitoring program. The water quality data for period 2003 through 2013 was analyzed to determine the impact of implemented BMPs on *E. coli* violation rate and the long term trend, if any, in water quality condition. The bar graph below shows the percent violation rate for samples collected annually at monitoring stations 2-LMC000.04 (Looney Creek) and 2-ELS000.08 (Ellis Run) that did not meet the water quality standard of 235 cfu/100 mL. The number of samples collected each year is shown above each bar. The linear trends fitted to the data show decreasing trends in violation rates over the sampling period, indicating improvements in water quality conditions in the Looney Creek and the Ellis Run watersheds.

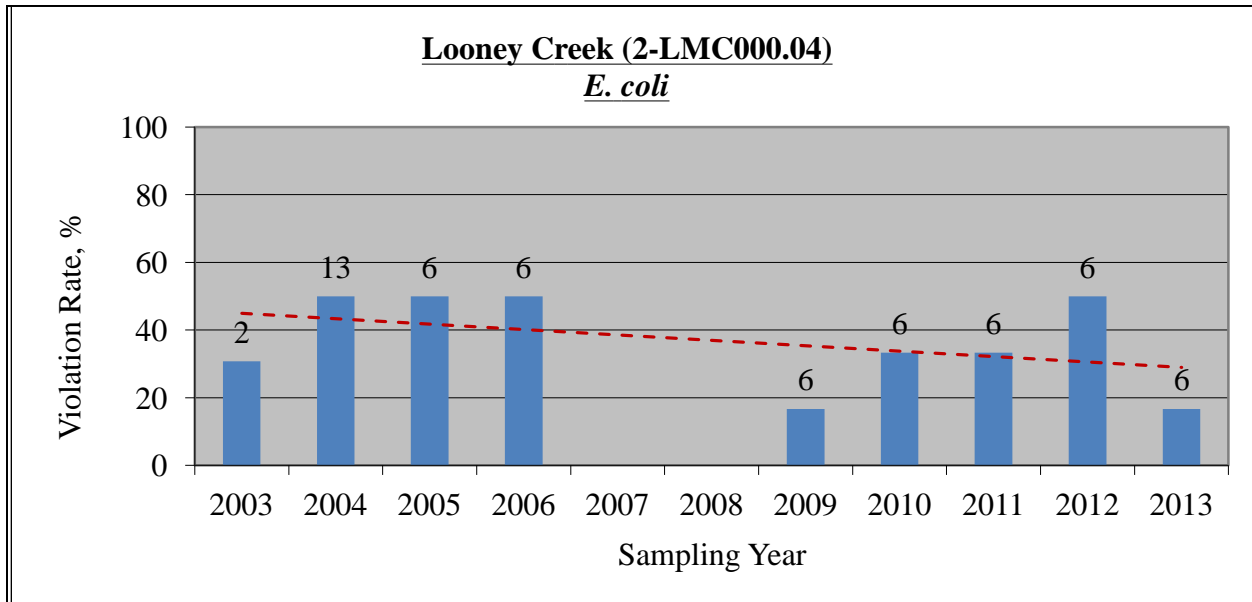


Figure II-9: Water Quality Data for Looney Creek

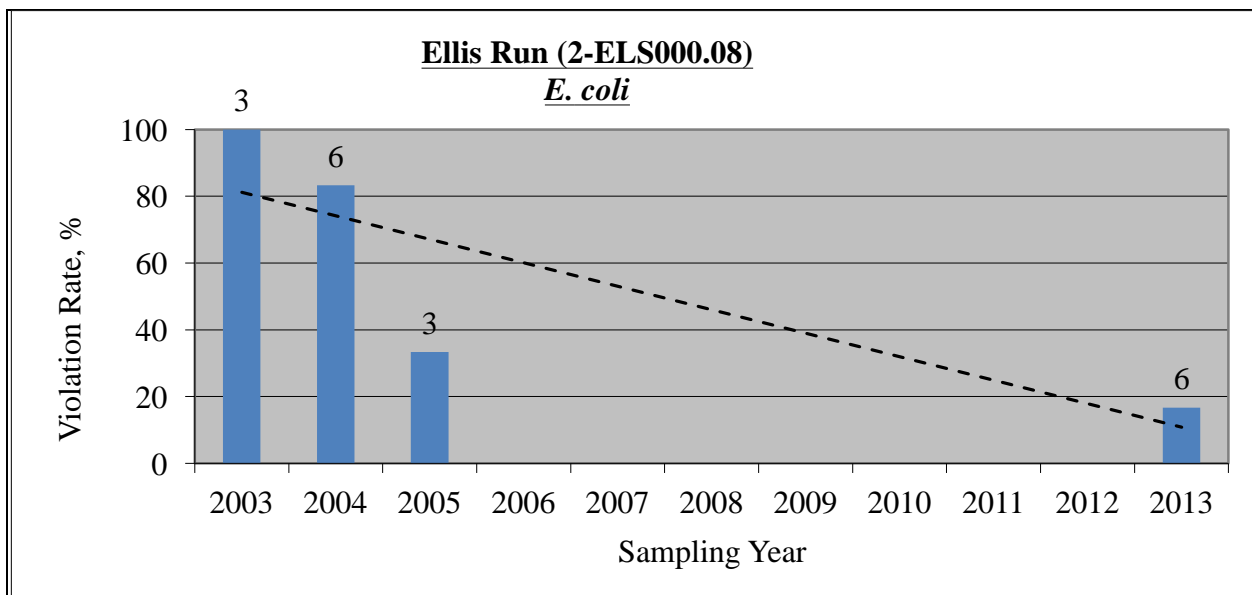
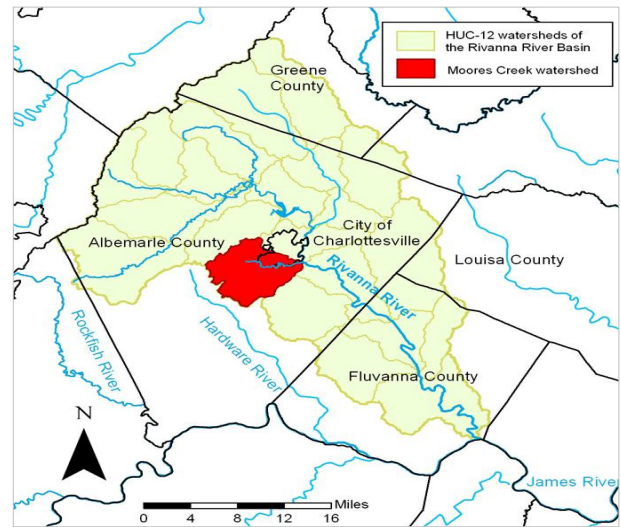


Figure II-10: Water Quality Data for Ellis Run

Current 319H Project Report - Moores Creek TMDL Implementation Project: January 2012-June 2014

Project Location

Moores Creek watershed is located within the Middle James watershed and drains 31.49 square miles of Albemarle County and 3.49 square miles of the City of Charlottesville, for a total drainage area of 34.92 square miles. Moores Creek flows approximately 11 miles from its source in the Ragged Mountains to its confluence with the Rivanna River in Charlottesville. Moores Creek was first listed as impaired due to violations of the State's water quality standard for fecal coliform on Virginia's 1998 303 (d) Total Maximum Daily Load Priority List and Report (DEQ, 1998). A TMDL for the bacteria impairment on Moores Creek was completed by DEQ and approved by EPA in 2002. A TMDL implementation plan was completed by the Thomas Jefferson Planning District Commission in 2003; however, it did not meet the nine eligibility criteria to receive EPA Section 319(h) funding. In 2012, DCR contracted the Rivanna River Basin Commission (RRBC) to complete an update to the implementation plan in order to meet the funding criteria and provide funding to the RRBC to implement the plan. The update was completed and approved by EPA in 2012.



Implementation Highlights

The RRBC was awarded Section 319(h) funds to administer a residential septic and pet waste education program in cooperation with project partners, while the Thomas Jefferson SWCD received state funds to support implementation of agricultural BMPs in the watershed. In April 2013, the RRBC underwent a significant change in structure and function and was no longer able to administer the implementation project and the Thomas Jefferson SWCD stepped in to fill this role. Despite considerable education and outreach efforts by project partners, little progress has been made in the agricultural BMP program in the Moores Creek watershed. Much of this has been attributed to the limited amount of farmland in the watershed. The residential program has encountered challenges as well, including lack of interest in pet waste composters from residential property owners. Between July 2013 and June 2014 five septic tank pumpouts and three septic system replacements were completed. Implementation progress is summarized in the BMP table shown here. Pollution reductions associated with these BMPs are summarized in the table below.

Table II-9: Moores Creek BMP Summary: January 2012 – June 2014

Control Measure**	Units*	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	F	27,766	0	----
Stream Exclusion Fencing	S	12	0	-----
Riparian Buffer	Ac	19	0	
Residential				
Pet Waste Composters	S	60	0	----
Pet Waste to Energy	S	1	0	----
Neighborhood Pet Waste Station	S	3	2	67
Pet Waste Education Program	Prgm	1	1	100
Residential Septic				
Septic Tank Pump Out	S	40	13	33
Connection to Public Sewer	S	41	1	2
Septic System Repair	S	62	1	2
Septic System Installation	S	33	3	9
Alternative Waste Treatment	S	31	0	0

NOTE: BMP counts only include 319 funded project and. BMPs funded by the VA Agricultural Cost Share Program *Ac = Acres, S = System, F = Feet

Table II-10: Pollution Reductions for Moores Creek: January 2012--June 2014

Period	Pathogens CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation tons/year
July 2013 – June 2014	1.37E+11	83	0	0
January 2011-June 2014	2.64E+11	160	0	0

Current 319H Project Report - Upper Hazel River TMDL Implementation Project: July 2009 – June 2014

Project Location

The Hazel River watershed covers approximately 135,610 acres and includes, along with the Hazel River, the Hughes, Rush, and Thornton Rivers. The Hazel River begins in Rappahannock County, Virginia south of Panorama and continues downstream to its confluence with Rappahannock River northwest of Remington, Virginia. The Rappahannock River forms in Fauquier County, Virginia southeast of Front Royal and continues downstream to the Chesapeake Bay. The Hazel River and its tributaries were placed on Virginia's 303(d) list of impaired waters for violations of the fecal coliform bacteria standard between 2002 and 2004. A TMDL study was completed to address these impairments in 2007.



Implementation Highlights

A TMDL implementation plan was developed for the Hazel River in May 2009. The Culpeper Soil and Water Conservation District (CSWCD) began administering the residential and agricultural BMP programs in July 2009. The table on the right shows BMPs implemented in the project area since it began and cumulative implementation progress.

From July 2013 thru June 2014 the CSWCD installed 17 agricultural BMPs. These included 11 livestock stream exclusion with riparian buffer practices and four stream exclusion with grazing land management, resulting in a total 21,106 linear feet of stream exclusion fencing. Also, extension of a CREP watering system providing 30 acres of improved grazing management and small cover crops on six acres were completed. In the residential program, 34 BMPs were installed between July 2013 and June 2014. This included 27 septic system pumpouts, six septic system repairs, and one septic system installation/replacement with pump.

Table II-11: Hazel River BMP Summary: July 2009 – June 2014

Control Measure*	Units**	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	F	2,307,360	181,322	8
Stream Exclusion Fencing	S	1,072	75	7
Riparian Buffer	Ac	----	102	----
Woodland buffer filter	Ac	----	3.8	----
Permanent vegetative cover on cropland	Ac	----	22	----
Veg. buffer on cropland	Ac	283	185	65
Residential Septic				
Septic Tank Pump Out	S	----	145	----
Septic System Repair	S	443	53	12
Septic System Installation	S	673	36	5
Alternative Waste Treatment	S	230	2	<1

NOT E: BMP counts after 7/1/2007 only include 317 funded projects. BMPs funded by State CS, CREP or Federal EQIP are not included after this date (though they may have been included previously)* Ac = Acres, S = System, F = Feet, CCU = Confined Canine Unit

Pollution reductions resulting from BMP installations since 2009 are summarized in the table below.

Table II-12: Pollution Reductions for Hazel River: July 2009-June 2014

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2013 – June 2014	4.11E+15	1,201	158	177
July 2009-June 2013	9.75E+15	6,313	718	674

The Virginia Department of Environmental Quality (DEQ) monitors the water quality of Upper Hazel River at several stations through the agency's ambient monitoring program. The water quality data available for period 2007 through 2013 was analyzed to determine the impact of implemented BMPs on *E. coli* violation rate and the trend, if any, in water quality condition. The bar graph below shows the percent violation rate for samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples collected each year is shown above each bar. The linear trend fitted to the data shows a decreasing trend in violation rates over the sampling period, indicating improvements in water quality condition in the Upper Hazel River Watershed.

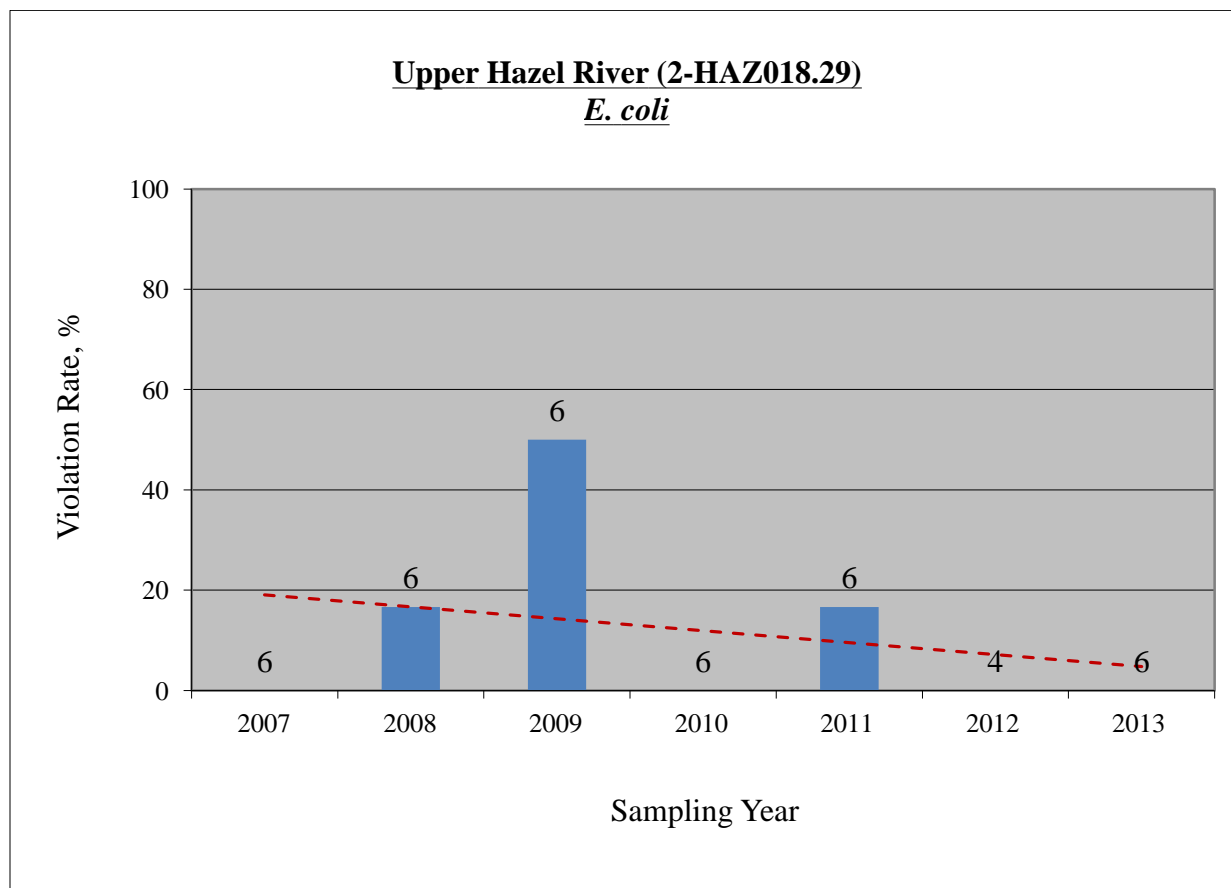
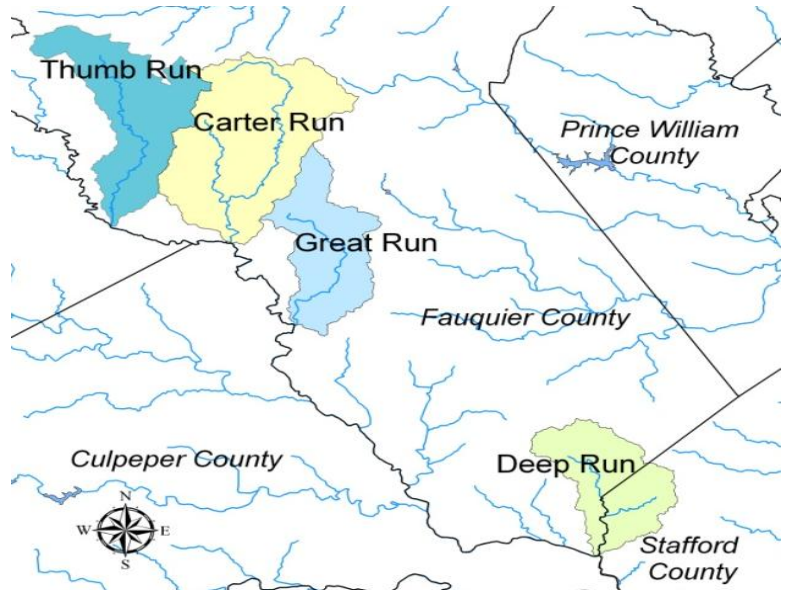


Figure II-11: Water Quality Data for Upper Hazel River

Current 319H Project Report - Thumb, Deep, Carter and Great Runs TMDL Project July 2006- June 2014

Project Location

Thumb Run, Carter Run, Great Run, and Deep Run are part of the Rapidan-Upper Rappahannock Basin in the Chesapeake Bay watershed. The Thumb Run, Carter Run and Great Run watersheds are located in Fauquier County, Virginia. The northern portion of Deep Run watershed lies in Fauquier County with the southern portion in Stafford County. The 92,800 acre project area is made up of forest (60%), agricultural (39%) and residential (1%) land uses. A TMDL implementation plan was developed to address a fecal coliform impairment on Thumb Run and *E. coli* impairments on Deep, Carter and Great Runs. Deep Run was first listed as impaired for fecal coliform on the 1996 303(d) list (DEQ, 1996). Thumb, Carter and Great Runs followed in 1998.



Implementation Highlights

The Thumb, Deep, Carter and Great Runs TMDL implementation project is administered by the John Marshall Soil and Water Conservation District (JMSWCD) and the Fauquier County Health Department. The Health Department was contracted to provide technical assistance and educational outreach to homeowners while JMSWCD delivers the agricultural BMP program and associated education and outreach. The table on the right shows BMPs implemented in the watersheds since the project began in July 2006 and implementation goals established for the project areas. Of note, 54 miles of livestock stream exclusion fencing has been installed in the watersheds. Outreach efforts for the project have included newspaper articles, mailings to landowners in the watersheds, and presentations to community organizations. Between July 2013 and June 2014, 14 livestock exclusion projects were completed in the watersheds totaling approximately 76,200 feet of streamside fencing. In addition, 85 acres of improved pasture management, four septic system repairs and one alternative waste treatment system were completed.

Table II-13: Thumb, Deep, Carter and Great Runs BMP Summary: July 2006 – June 2014

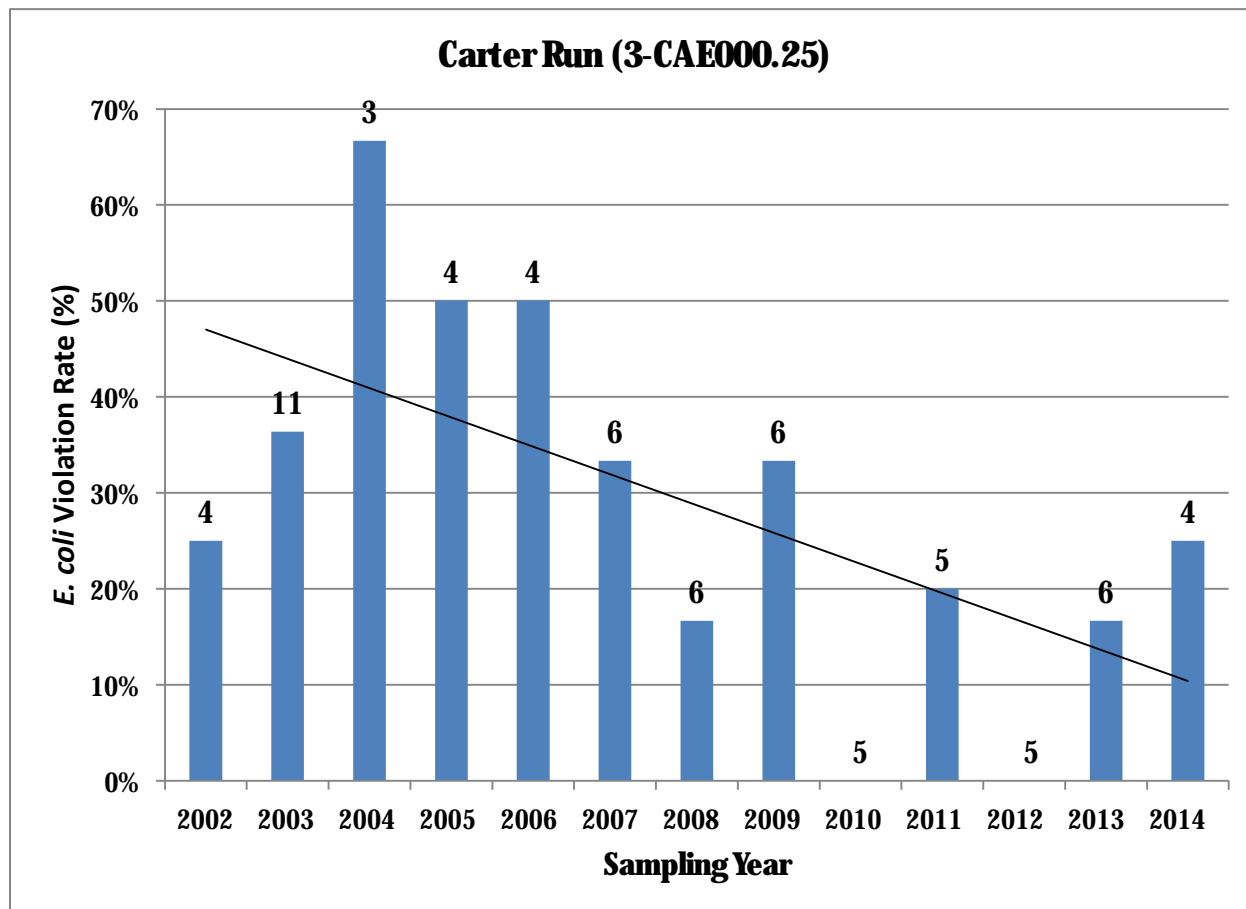
Control Measure**	Units*	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	F	421,947	285,621	68
Stream Exclusion Fencing	S	167	480	35
Riparian Buffer	Ac	----	229	----
Pasture Management	Ac	16,459	273	2
Veg. Cover on Cropland	Ac	-----	94	-----
Urban/Residential Pet Waste				
Pet waste landscape demo.	S	2	2	100
Residential Septic				
Septic Tank Pump Out	S	----	240	----
Septic System Repair	S	102	62	61
Septic System Installation	S	146	15	10
Alternative Waste Treatment	S	44	1	2

NOTE: BMP counts only include 319 funded project and. BMPs funded by the VA Agricultural Cost Share Program *Ac = Acres, S = System, F = Feet

The pollution reductions resulting from BMP installations beginning in 2006 are summarized in the table below.

Table II-14: Pollution Reductions for Thumb, Deep, Carter and Great Runs: July 2006-June 2014

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation- Siltation tons/year
July 2013-June 2014	2.40E+15	48,467	7,110	8,888
July 2006-June 2014	8.98E+15	136,642	9,539	11,923



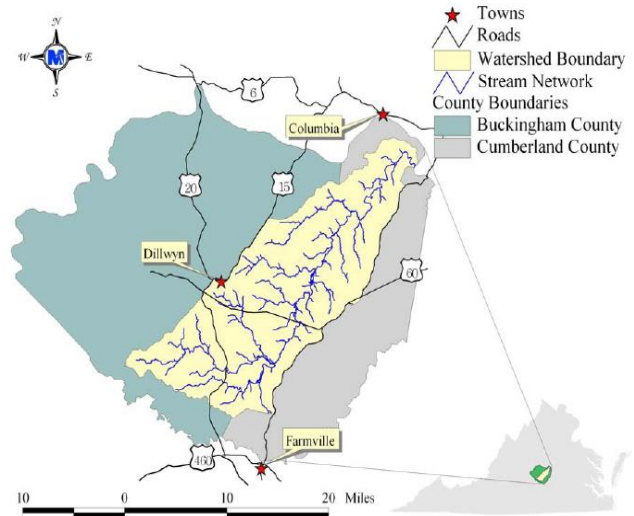
(CFU) per 100

Figure II-12: Water Quality Data for Carter Run

Current 319H Project Report - Willis River TMDL Implementation Project: July 2005-June 2014

Project Location

Located approximately 60 miles west of Richmond in the Piedmont, the Willis River and its tributaries in Buckingham and Cumberland counties were first listed as not meeting water quality standards on Virginia's 1996 303 (d) list of impaired waters. The impairment was due to violations of the State's fecal coliform bacteria standard for recreational contact. Through the joint efforts of the DEQ, Virginia Department of Conservation and Recreation (DCR) and the Peter Francisco Soil and Water Conservation District (PFSWCD), as well as other stakeholders, various agricultural and residential best management practices (BMPs) have been installed through a TMDL implementation project funded with EPA Section 319(h) funds that began in 2005. These BMPs include: a dairy loafing lot management system, composting facilities, animal waste storage, and livestock stream exclusion with grazing land protection systems, riparian buffers, septic tank pump-outs, septic system repairs and replacements.



Project Background and Problem Identification

The Willis River watershed is part of the James River Basin (HUC 02080205, VAC-H35R and VAC H36R). The land area is approximately 177,936 acres, with woodlands and pasture as the primary land uses. The watershed is comprised of forest (75%), water (1%), wetlands (2%) agricultural (21%), and urban (1%) land uses.

In 1996, the Willis River was placed on the Commonwealth of Virginia's 1996 303(d) list because of violations of the fecal coliform bacteria water quality standard. The original 1996 impaired segment of the Willis River stretched from the confluence with the James River upstream to Reynolds Creek (14.53 miles). The segment was extended in the 2004 cycle to include the entire Willis River from the headwaters to the mouth (61.34 miles). The fecal coliform TMDL for the Willis River was completed in 2002. In 2005, DCR and Peter Francisco Soil and Water Conservation District, with extensive input from other stakeholders, completed a TMDL implementation plan and commenced a 5-year implementation project to reduce fecal coliform levels in the Willis River through implementation of agricultural and residential BMPs.

Project Highlights

Residential and agricultural conservation successes have largely been the result of partnerships between the PFSWCD and several state agencies including the Virginia Departments of Conservation and Recreation and Environmental Quality, Virginia Cooperative Extension, Farm Bureau, Cattlemen's Association, and USDA – Natural Resources Conservation Service. Numerous tours have been held to promote the agricultural and residential BMPs offered under the TMDL implementation plan, along with presentations at civic clubs throughout the watersheds, postcard mailings advertising the program, personal contacts with farmers and residents, and meetings updating the community about the water quality improvements.

From July 1, 2013 thru June 30, 2014 four livestock stream exclusion practices were installed protecting 11,334 linear feet of stream. During this period eight septic pump outs, one septic system repairs and one septic system installation were also completed. Since the beginning of the project in July 2005 through June 30, 2014, there have been 86 agricultural practices completed. Approximately 43.5 miles of stream fencing has been installed. For the residential program to date, 80 septic projects have been implemented including 62 septic tank pump out, 12 septic

systems repairs and six septic systems replacements. The pollution reductions as a result of the BMPs installed included at the bottom of the page are only for 319(h) funded practices.

The Virginia Department of Environmental Quality (DEQ) monitors the impaired streams through the agency's ambient monitoring program. DEQ monitors several stations throughout the Willis River Watershed. Analysis of data from several sites has shown significant improvements in the water quality conditions of various segments of the Willis River. Subsequently three stream reaches were delisted due to the bacteria violation rates being 10% or less. These sites include:

- VAC-H35R_WLS02A04, 9.92 miles (station 2-WLS004.27), which had a violation rate of 2/20 with a 10% violation rate and was listed in the 2006 303(d)/305(b) report as attaining standards, and
- VAC-H36R_WLS02A06, 8.11 miles, which had a violation rate of 1/20 with a less than 10% violation rate and was listed in the 2006 303(d)/305(b) report as attaining standards, and
- VAC-H36R_WLS01A00, 16.68 miles (station 2-WLS042.78), which had a violation rate of 2/21 with a 9.5% violation rate and was listed in the 2008 303(d)/305(b) report as attaining standard.

As a result of activities a total of 34.71 miles are now meeting water quality standards and changed to category 2C. For the 2006 303(d) list the bacteria standard was based on fecal coliform, 400 colony forming units (CFU) per 100 ml of water. For the 2008 303(d) list the standard changed to *E. coli* at 235 CFU per 100 ml of water.

The pollution reductions resulting from BMPs installations are summarized in table below.

Table II-15: Willis River BMP Summary: August 2005 - June 2014

Control Measure*	Unit	Units Needed	# Installed	% Goal
Agricultural				
Stream Exclusion Fencing	Miles	475,000	229,879	48
Stream Exclusion Fencing	System	318	65	20
Riparian Buffer Established	Acre		67	
Stream Crossing & Hardened Access	System		10	
Loafing Lot Management	System		1	
Animal Waste Storage Facility	System		4	
Composting Facility	System		3	
Permanent Vegetative Cover on Cropland	Acre		46	
Residential				
Septic System Pump Out	System	100	62	62
Septic System Repair	System	3	12	400
Septic System Installation	System	2	6	300
<small>BMP counts after 7/1/2010 only include 319, WQIF and VNRCF funded projects. BMPs funded by State CS CREP or Federal EQIP are not included after this date (though they may have been included previously)</small>				
Water Quality Goals Met	Unit	Miles needed	Miles Delisted	% Goal
Stream Miles impaired on 303(d) list	Miles	61	34.5	57

Table II-16: Pollution Reductions for the Willis River: August 2005-June 2014

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorous Lbs/year	Sedimentation-Siltation Tons/year
July 2005-June 2013	1.82 E+16	7,128	1,349	1,217
July 2013-June 2014	5.37E+14	3,587	568	647

Also, the water quality data for period 2003 through 2013 was analyzed to determine the impact of implemented BMPs on *E. coli* violation rate and the long term trend, if any, in water quality condition. The bar graph below shows the percent violation rate for samples collected annually at monitoring station 2-WLS0025.32 that did not meet the water quality standard of 235 cfu/100 mL. The number of samples collected each year is shown above each bar. The linear trend fitted to the data shows a decreasing trend in violation rates over the sampling period, indicating improvements in water quality condition in the Willis River watershed.

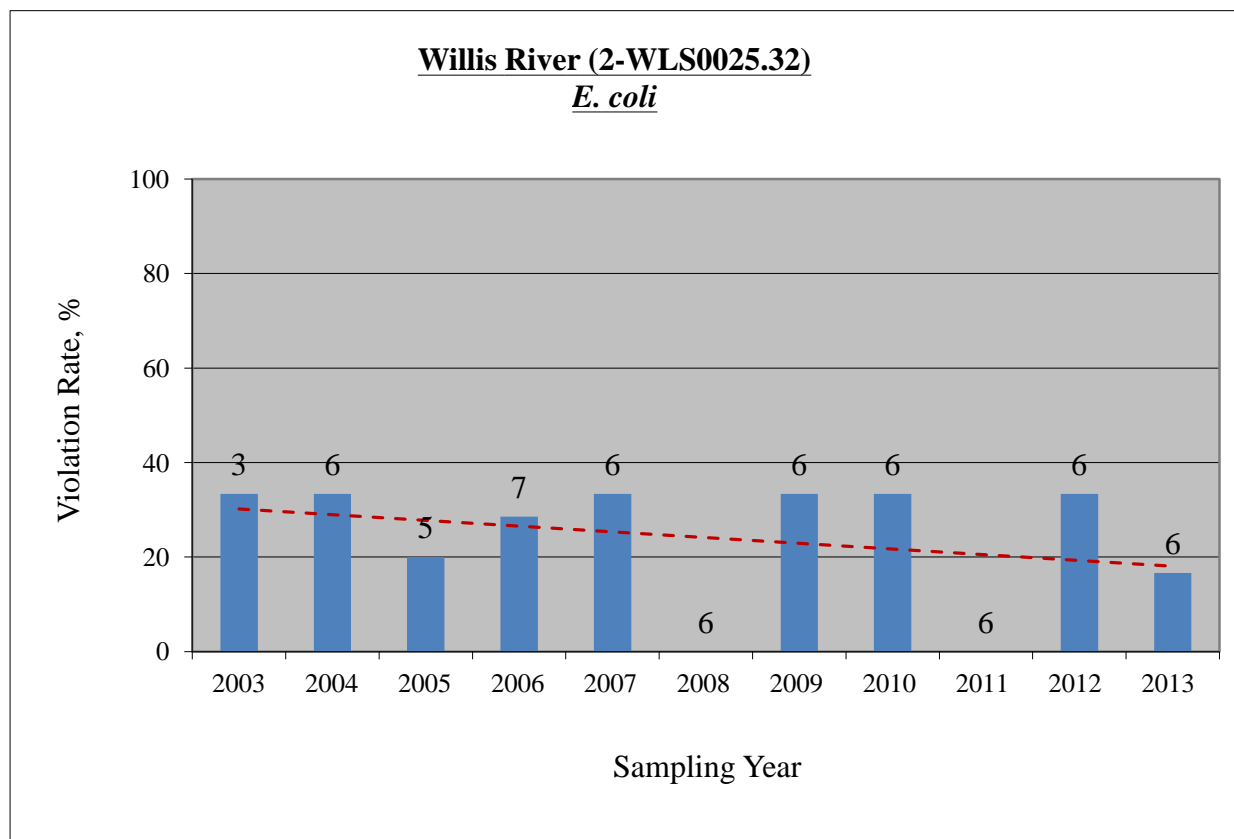
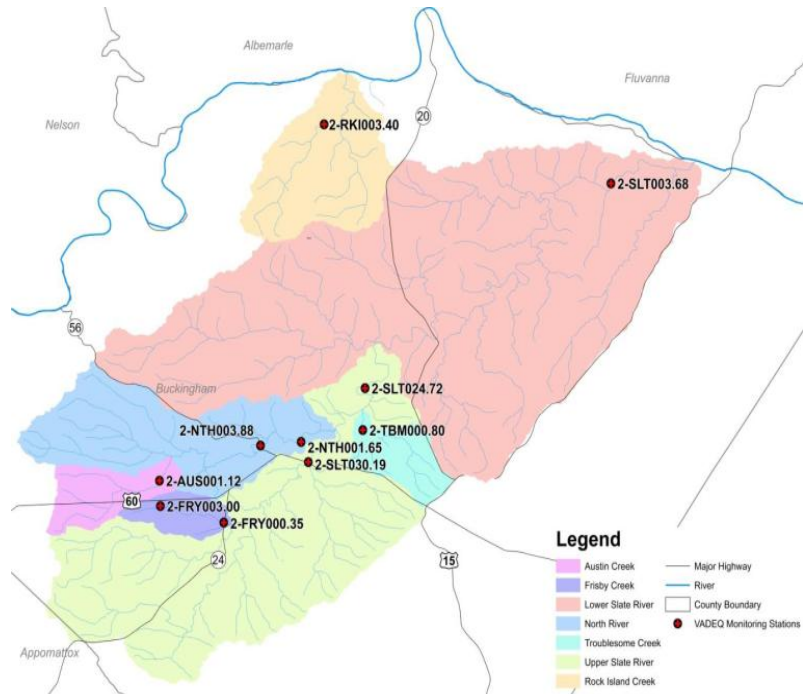


Figure II-13: Water Quality Data for Willis River

Current 319H Project Report - Slate River TMDL Implementation Project: July 2011-June 2014

Project Location

Located approximately 60 miles west of Richmond in the Piedmont, the Slate River and Rock Island Creek and its tributaries in Buckingham County were listed as not meeting water quality standards on Virginia's 2002 and 2004 303(d) lists of impaired waters. The impairments were due to violations of the State's bacteria standard for recreational contact. Through the joint efforts of the DEQ, Virginia Department of Conservation and Recreation (DCR) and the Peter Francisco Soil and Water Conservation District (PFSWCD), as well as other stakeholders, a water quality improvement plan was started to install various agricultural and residential best management practices (BMPs) through a Total Maximum Daily Load (TMDL) implementation project funded with EPA Section 319(h) funds that began in July 2011.



Project Background and Problem Identification

The Slate River and Rock Island Creek watersheds are located in Buckingham County and are part of the James River Basin (HUC 02080205). The Slate River watershed is approximately 156,940 acres, and is comprised of forest (87%), pasture/cropland (10%), water/wetland (2%), and residential (1%) land uses. The Rock Island Creek watershed is approximately 13,050 acres with forest as the primary land use (92%), followed by pasture/cropland (6%), water/wetland (2%), and residential (1%) land uses.

In 2002, the lower and upper Slate River and its tributaries (Frisby Branch and North River) were placed on the Commonwealth of Virginia's 303(d) list because of violations of the bacteria water quality standard. Rock Island Creek, Austin Creek and Troublesome Creeks were listed in 2004, also for violations of the bacteria standard. The impaired stream segments include 6.14 miles of Austin Creek, 3.83 miles of Frisby Branch, 8.44 miles of North River, 0.95 miles of Troublesome Creek, 16.92 miles of the Slate River, and 8.84 miles of Rock Island Creek. The Slate River empties into the James River, and Rock Island Creek, a tributary of the James River, empties into the James west of the confluence of the Slate and James Rivers.

The bacteria TMDL study for the Slate River and Rock Island Creek was completed by DEQ in 2007. In 2010, DCR and Peter Francisco Soil and Water Conservation District, with input from other stakeholders, completed a TMDL implementation plan and commenced the implementation project to reduce bacteria levels in the Slate River and Rock Island Creek watersheds. The implementation project also covers Muddy Creek and Turpin Creek, which were listed as impaired due to excess bacteria after completion of the TMDL study.

Project Highlights

The field visits were conducted to promote the agricultural and residential BMPs offered under the TMDL implementation plan, along with postcard mailings advertising the program and personal contacts and meetings with farmers and residents about the water quality improvement programs.

From July 1, 2013 through June 30, 2014, 12,090 linear feet of livestock exclusion fencing was installed. Also, five septic tank pump outs and three septic system installations/replacements were completed. During July 2013-June 2014, 14 farm visits and stakeholders meetings were conducted to promote various agricultural and residential best management practices among the land owners of the watersheds. Six livestock exclusion systems were installed. Also, eight residential practices were completed during second year of the project.

**Table II-17: Slate River and Rock Island Creek BMP Summary:
July 2011-June 2014**

Control Measure*	Unit	Units Needed	# Installed	%
Agricultural				
Stream Exclusion Fencing	Feet	1,367,520	14,280	1
Stream Exclusion Fencing	System	406	8	2
Extension of CREP Watering System	Acre		48	
Reforestation of Erodeable Crop & Pastureland	Acre	30	47	157
Residential				
Septic System Pump Out	System	187	32	17
Septic System Repair	System	90	0	0
Septic System Installation	System	97	8	8
Alternate On-Site System	System	4	2	50
*NOTE: BMP counts after 7/1/2010 only include 319, WQIF and VNRFC funded projects. BMPs funded by State CS CREP or Federal EQIP are not included after this date (though they may have been included previously)				

The pollution reductions resulting from BMP installations are summarized in the table below.

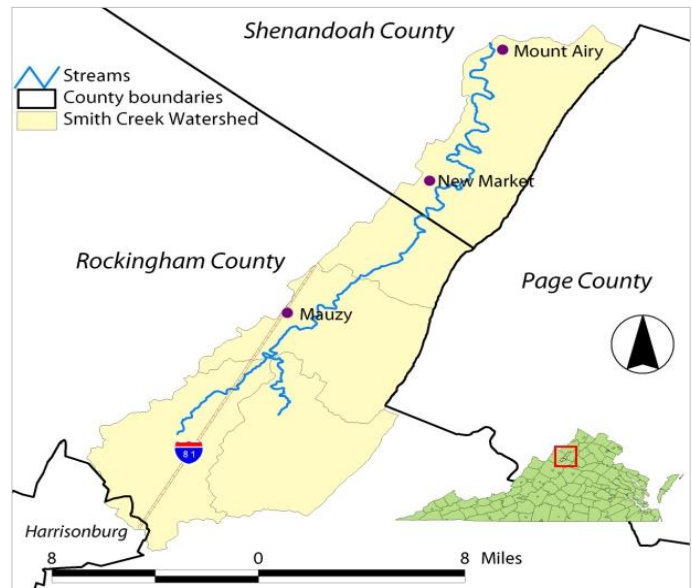
Table II-18: Pollution Reductions for the Slate River and Rock Island Creek: July 2011-June 2014

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2013-June 2014	1.49E+15	2,171	276	384
July 2011-June 2013	7.67E+13	2,038	242	107

Current 319H Project Report - Smith Creek TMDL Implementation Project: January 2012-June 2014

Project Location and Background

The Smith Creek watershed is located in the Potomac River Basin in Shenandoah and Rockingham counties, with a small portion of the headwaters located in the City of Harrisonburg, Virginia. The watershed is approximately 67,900 acres in size and land use is predominantly forest and agricultural. Smith Creek was listed as impaired on Virginia's *Section 303(d) Total Maximum Daily Load Priority List and Report* due to violations of the State's Water Quality Standards for fecal coliform bacteria and violations of the General Standard (benthic) (VADEQ 1998, 2002). The Smith Creek TMDLs were completed in April 2004 and approved by EPA in June 2004. A stressor analysis was performed during development of the benthic TMDL, and sediment was identified as the primary stressor causing the aquatic life use impairment in Smith Creek. A TMDL implementation plan was completed for Smith Creek in February 2009. Shortly after completion of the implementation plan, Smith Creek was designated as a Showcase Watershed by NRCS.



Implementation Highlights

The Smith Creek TMDL implementation project is administered by the Shenandoah Valley Soil and Water Conservation District (SVSWCD). The table on the right shows BMPs implemented in the watersheds since the project began in January 2012 and overall implementation goals.

The residential septic program is rapidly growing in recognition in the local community. In addition, a large stormwater BMP that includes a series of bioretention filters and wetland treatment cells will be completed in fall 2014. Between July 1, 2013 and June 30, 2014, 68 septic tank pumpouts and eight septic system repairs were completed. In addition, three failing septic systems were replaced including one alternative waste treatment system. Pollution reductions resulting from these BMP installations are summarized in the table below. In addition, the Showcase Watershed Designation has provided assistance with program outreach including articles in newsletters distributed to watershed landowners and other promotional materials. The Showcase Watershed Designation has resulted in considerable targeting of resources to encourage agricultural BMP implementation, some of this work is captured in the report. Since this project began, over 33,000 feet of livestock exclusion fencing has been installed in the watershed through CREP and the VACS Program. This total does not include additional fencing that was

Table II-19: Smith Creek BMP Summary:
January 2012 – June 2014

Control Measure**	Units*	Needed	Installed	%
Agricultural				
Livestock exclusion	F	913,150	33,148	4
Riparian buffers (pasture)	A	436	28	6
Pasture management	A	20,235	52	<1
Manure storage facility	S	8	2	25
Urban/Residential				
Pet waste program	P	1	Ongoing	100
Vegetated buffer	Ac	44	0	0
Rain gardens	Ac	109	0	0
Bioretention filters	Ac	45	0	0
Residential Septic				
Septic tank pump out	S	1,108	101	9
Connection to public sewer	S	7	0	0
Septic system repair	S	8	12	150
Septic system installation	S	19	2	11
Alternative waste treatment	S	70	2	3

stem

**NOTE: BMP counts only include 319 funded project and. BMPs funded by the VA Agricultural Cost Share Program *Ac = Acres, S = System, F = Feet

installed through Federal EQIP practices. In addition, two manure storage facilities have been installed, and 52 acres of improved pasture management.

Table II-20: Pollution Reductions for Smith Creek: January 2012-June 2014

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation- Siltation tons/year
January 2012-June 2014	1.88E+15	10,733	2,501	1,853
July 2013-June 2014	5.41E+14	1,745	304	239

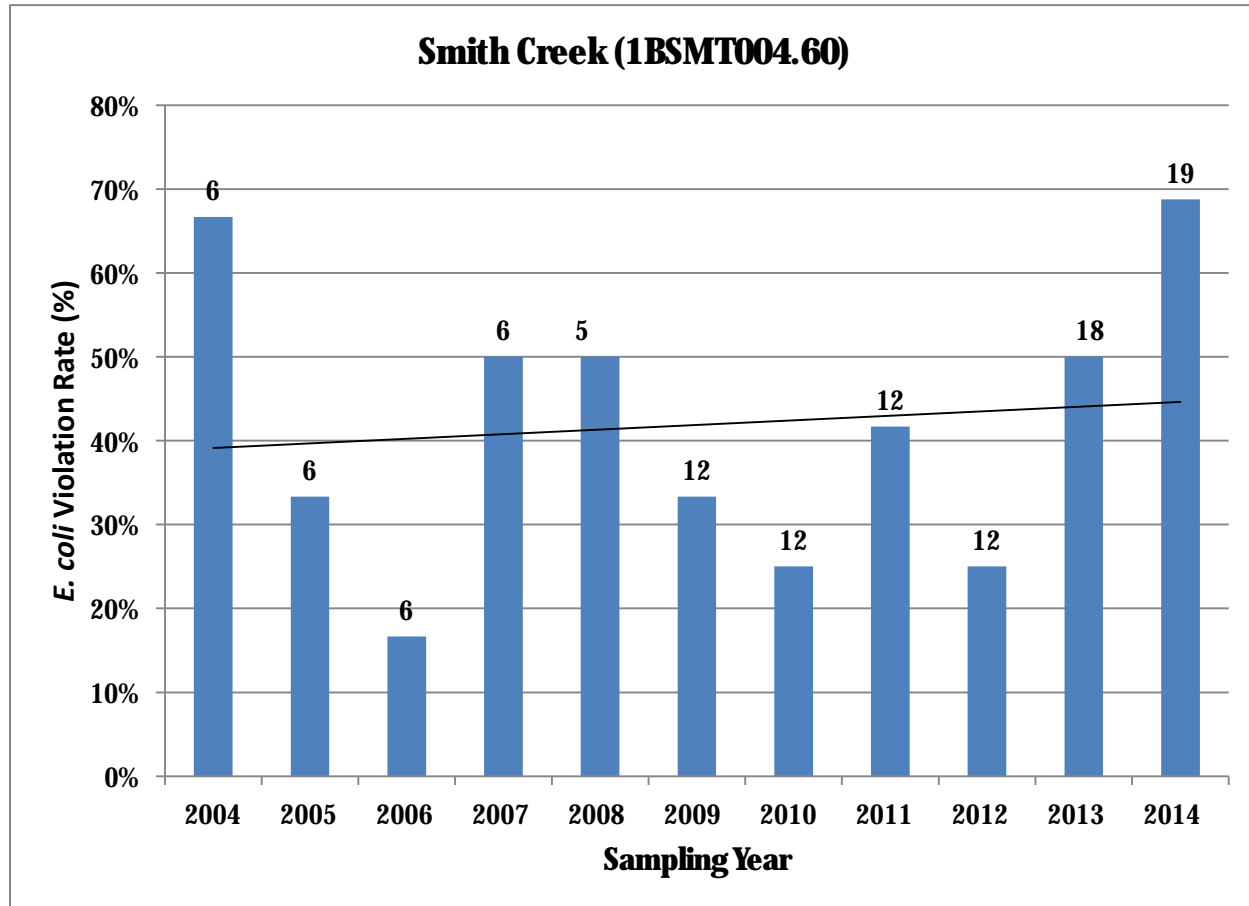
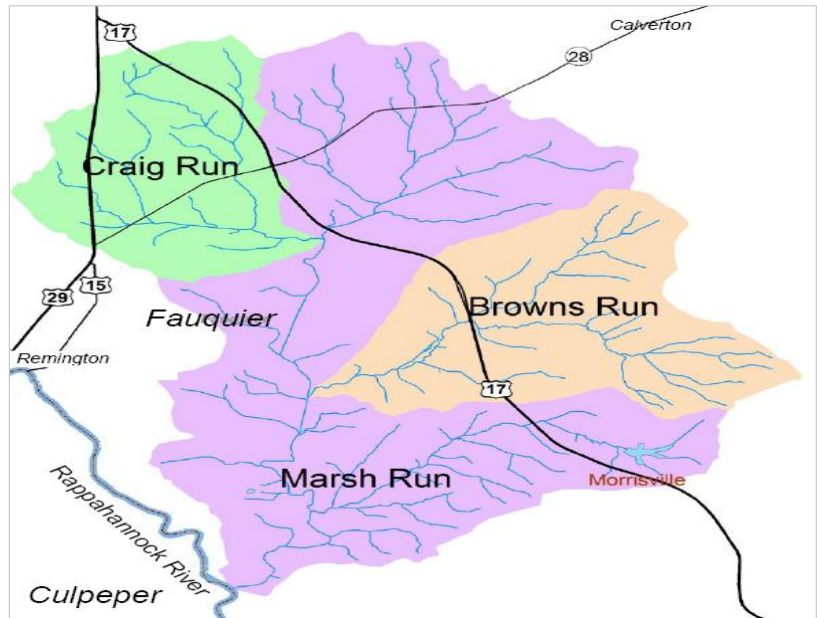


Figure II-14: Water Quality Data for Smith Creek

Current 319H Project Report - Craig, Brown and Marsh Runs TMDL Implementation Project: July 2012-June 2014

Project Location and Background

The Craig, Browns, and Marsh Run watersheds are located in Fauquier County, VA in the Rappahannock River Basin. The watersheds comprise approximately 29,400 acres, with agriculture and forest as the predominant land uses. Marsh Run, Browns Run, and Craig Run were initially placed on Virginia's Section 303(d) Total Maximum Daily Load Priority List and Report in 1996, 2002, and 2004 respectively for exceeding the bacteria standard. Bacteria TMDLs were completed for the creeks in April 2007 as part of the Rappahannock River Basin TMDL, which was approved by EPA in January 2008. A TMDL implementation plan was completed for Craig, Browns and Marsh Runs in November 2010.



Implementation Highlights

The John Marshall SWCD administers the implementation project for the Craig, Brown and March Runs TMDLs. The SWCD was awarded funds for agricultural and residential BMP implementation in July 2012. The SWCD is working to implement education and outreach strategies that have proven successful in other TMDL implementation project areas including working with home owner associations, community based organizations and local businesses to increase awareness of local water quality issues and the availability of the cost-share assistance. Between July 2013 and June 2014, 292 acres of pasture management and 26 acres of permanent vegetative cover on cropland were completed. In addition, five septic tank pumpouts and one septic system replacement were completed. A summary of the BMPs installed since this project began is provided in the table on the right. Associated pollutant reductions are shown in the table below.

Table II-21: Craig, Brown and Marsh Runs BMP Summary: January 2012 – June 2014

**Control measure	Units*	Extent needed	Extent installed	%
Agricultural				
Livestock exclusion fencing	F	343,200	22,280	6
Livestock exclusion fencing	S	93	5	5
Improved pasture mgmt.	Ac	14,544	292	2
Reforestation of pasture or cropland	Ac	80	0	0
Permanent vegetative cover on cropland	Ac	80	26	32
Residential				
Septic tank pumpout	S	40	13	3
Connection to public sewer	S	5	0	0
Septic system repairs	S	266	1	<1
Septic system replacements	S	138	3	2
Alternative waste treatment system	S	44	0	0
Pet waste education program	P	1	Ongoing	100

****NOTE:** BMP counts only include 319 funded project and. BMPs funded by the VA Agricultural Cost Share Program *Ac = Acres, S = System, F = Feet

Table II-22: Pollution Reductions for Craig, Brown and Marsh Runs: July 2012-June 2014

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation- Siltation tons/year
July 2012-June 2014	1.78E+15	5,739	825	1,031
July 2013-June 2014	7.61E+14	678	94	118

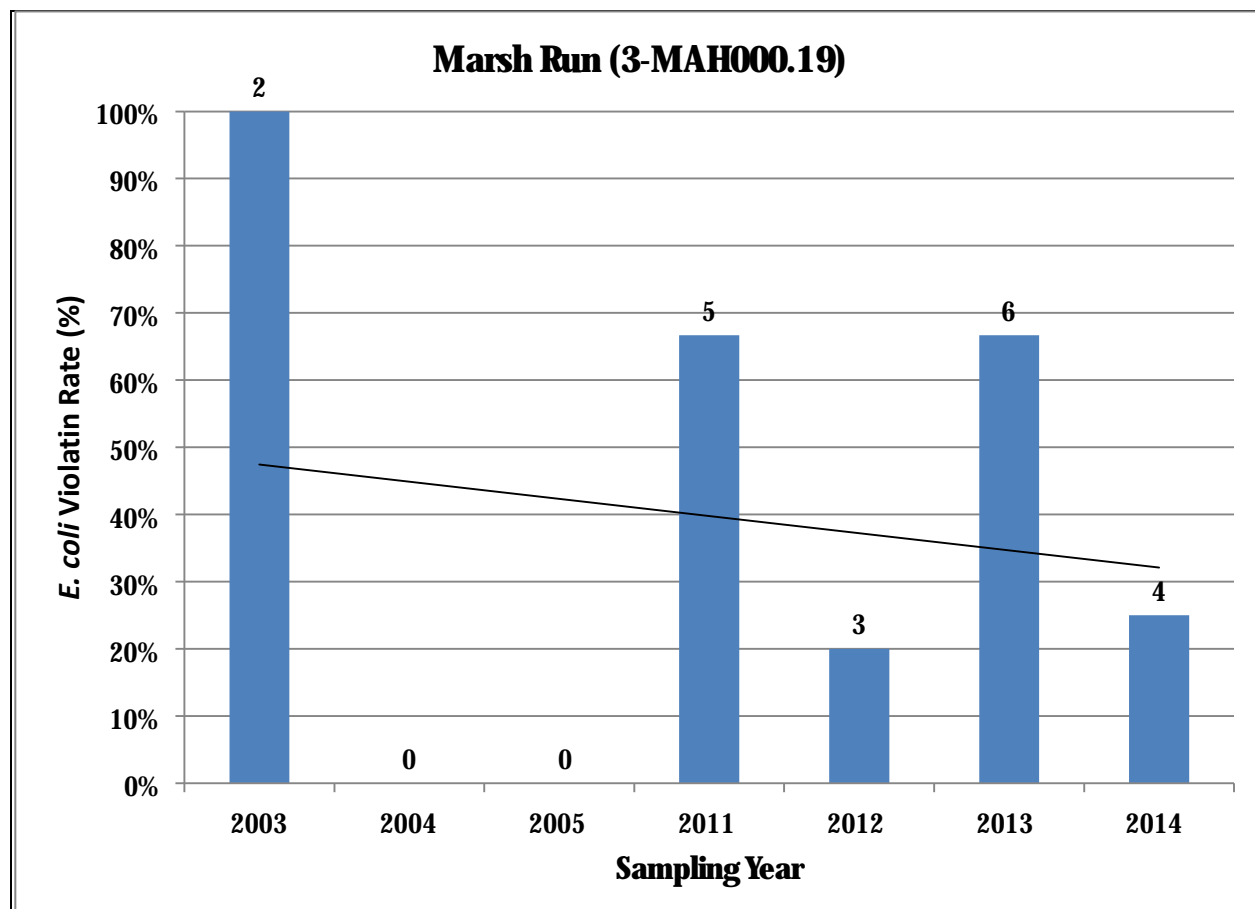
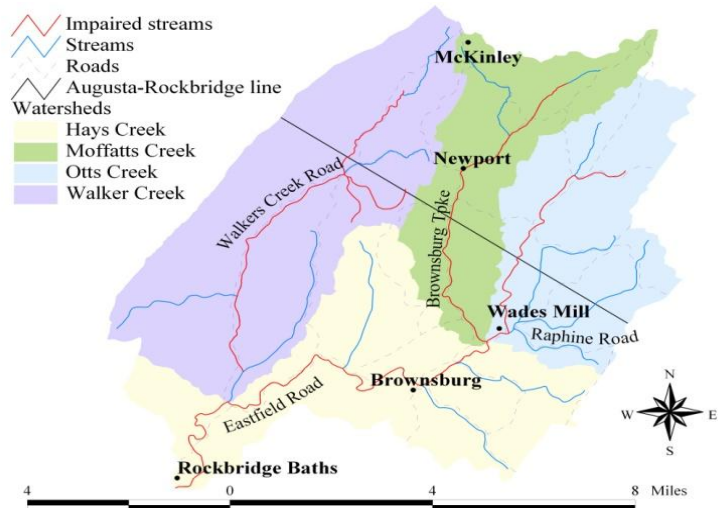


Figure II-15: Water Quality Data for Marsh Run

Current 319H Project Report - Hays Creek TMDL Implementation Project: October 2012-June 2014

Project Location and Background

The Hays Creek watershed is located in the Upper James River Basin in Augusta and Rockbridge counties, Virginia. The watershed is approximately 51,500 acres in size and land use is predominantly forest and agricultural. Hays Creek and its tributaries (Otts, Moffatts and Walker Creeks) were listed as impaired on Virginia's 1998 Section 303(d) Total Maximum Daily Load Priority List and Report due to violations of the State's Water Quality Standards for fecal coliform bacteria and violations of the General Standard (benthic). The Hays Creek TMDL was completed in January 2008 and a TMDL implementation plan was completed in December 2010.



Implementation Highlights

The Hays Creek TMDL implementation project is administered by the Natural Bridge Soil and Water Conservation District (NBSWCD) in partnership with the Headwaters SWCD. The project area spans the coverage areas of the two SWCD's, allowing for a collaborative approach to implementation. The table on the right shows BMPs implemented since the project began in October 2012 and overall implementation goals for the project areas.

The agricultural program has been well received in the watersheds, particularly with respect to livestock exclusion practices offered with 100% cost share. However, the residential program has gotten off to a much slower start with limited participation in the watersheds to date. Between July 1, 2013 and June 30, 2014, 11,057 feet of stream exclusion fencing was installed and 7.6 acres of riparian buffers were established. In addition, five septic tank pumpouts were completed. Pollution reductions resulting from these BMP installations are summarized in the table below.

Table II-23: Hays Creek BMP Summary:
July 2012 – June 2014

Control Measure	Units*	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	F	353,062	18,273	5
Stream Exclusion Fencing	S	115	11	10
Riparian Buffer	Ac	275	13	5
Improved pasture mgmt.	Ac	23,356	0	0
Reforestation of highly erodible pasture	Ac	1,000	0	0
Sod waterways	Ac	49	0	0
Continuous no till	Ac	502	0	0
Veg. buffer on cropland	Ac	73	0	0
Permanent vegetative cover on cropland	Ac	----	24	----
Manure storage	S	11	1	9
Residential Septic				
Septic Tank Pump Out	S	66	5	8
Septic System Repair	S	90	0	0
Septic System Installation	S	28	0	0
Alternative Waste Treatment	S	57	1	2

* AC = Acres, S = System, F = Feet of stream

Table II-24: Pollution Reductions for Hays Creek: July 2012-June 2014

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2012-June 2014	1.58E+15	7,858	1,547	1,438
July 2013-June 2014	4.34E+14	5,114	1,008	933

Current 319H Project Report – Upper York River Basin Watershed Implementation Project: July 2012- June 2014

Project Location

The project area consisting of multiple impaired watersheds is located in Orange County, Virginia. Beaver Creek, Mountain Run, Pamunkey Creek, and Terrys Run were initially placed on the Commonwealth of Virginia's Section 303(d) List of Impaired Waters in 1998 for exceedances of the bacteria standard. Mountain Run and Beaver Creek flow south and drain into the North Anna River. Pamunkey Creek and Terrys Run drain directly into Lake Anna. Mountain Run watershed area (9,464 acres) consists of forest (50%), pasture/hayland (43%), residential (3%), water/wetland (2%), and cropland (2%). Beaver Creek watershed (6,315 acres) is mainly a forested watershed (about 88%) with pasture/hayland (9%) and water/wetland (3%) of the area. Pamunkey Creek watershed (34,382 acres) is comprised of forest (54%), pasture/hayland (36%), cropland (7%), residential (2%), and water/wetland (1%). The 18,614 acres in the Terrys Run watershed consists of forest (58%), pasture/hayland (29%), cropland (12%), and the remaining 1% split between residential and water/wetland land uses. A TMDL implementation plan was developed in 2011 to address these bacteria impairments.

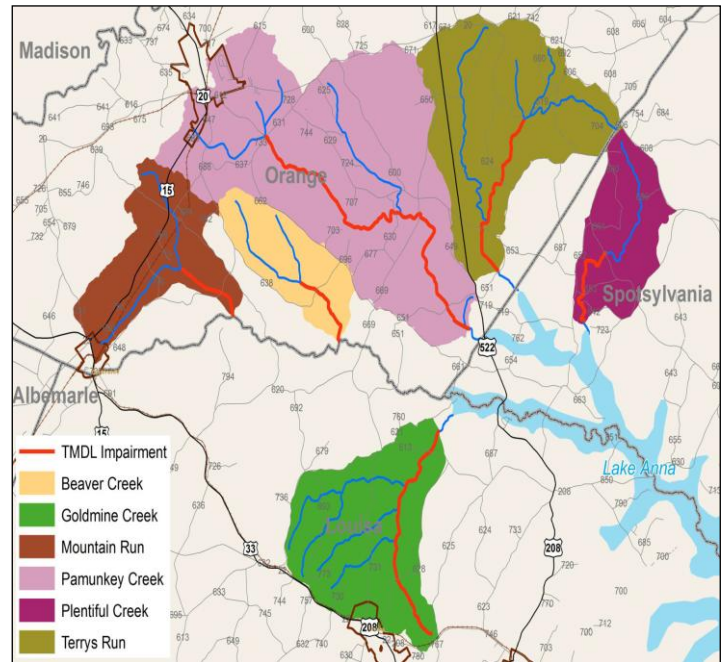


Table II-25: Upper York River Basin BMP Summary:
July 2012 – June 2014

Control Measure**	Units*	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	F	744,480	46,488	6
Stream Exclusion Fencing	S	320	9	3
Residential Septic				
Septic Tank Pump Out	S	514	40	8
Septic System Repair	S	302	4	1
Septic System Installation	S	152	12	8
Alternative Waste Treatment	S	50	0	0

*Ac = Acres, S = System, F = Feet, P = Program, CCU = Concentrated Canine Unit

Implementation Highlights

The implementation project is administered by the Culpeper Soil and Water Conservation District. The District was contracted to provide technical assistance and educational outreach to farmers and homeowners for agricultural and residential BMP implementation. The table on the right shows BMPs implemented in the watersheds since the project began in July 2012 and implementation goals established for each of the control measures. Outreach efforts for the project have included various meetings, newspaper articles, of mailing to landowners in the watersheds, and presentations to community organizations. Between July 2013 and June 2014, under Agricultural BMP program, 32,562 linear feet of livestock exclusion stream fencing was installed. Under residential program, 32 septic tank pumpouts, three septic system repair, and seven septic system replacements were completed in the watersheds.

The pollution reductions resulting from BMP installations are summarized in the table below.

Table II-26: Pollution Reductions for Upper York River Watershed: July 2012-June 2014

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2012-June 2013	2.20E+14	586	50	16
July 2013-June 2014	1.47E+15	3,666	394	615

Other Project Report – Robinson River and Little Dark Run TMDL Implementation Project: July 2012- June 2014

Project Location

The Upper Robinson River drains into the Rapidan River, which joins Rappahannock River then empties into the Chesapeake Bay. The Upper Robinson River and Little Dark Run watersheds are located in Madison County, Virginia. The Lower Robinson River watershed runs along border between Madison and Culpeper Counties. The 30,892 acre of Upper Robinson River watershed is mainly made up of forest (84%), agricultural (15%), , and residential (1%). The 124,326 acre of Lower Robinson River watershed has forest (64%), agricultural (34%), and residential and wetland/water (2%). The 2,334 acre of Little Dark Run watershed has forest (58%), agricultural (29%), residential (12%), and water/wetland (1%). The Upper and Lower Robinson River and Little Dark Run were initially listed as impaired for bacteria on the Commonwealth of Virginia's Section 303(d) List of Impaired Waters in 1994, 2002, and 2004 , respectively. A TMDL implementation plan was developed in 2011 to address these bacteria impairments.



Implementation Highlights

The Little Dark Run and Robinson River implementation project is administered by the Culpeper Soil and Water Conservation District. The District was contracted to provide technical assistance and educational outreach to farmers and homeowners for residential BMP implementations. The table on the right shows BMPs implemented in the watersheds since the project began in July 2012 and implementation goals established for each of the project areas. Outreach efforts for the project have included newspaper articles, of mailing to landowners in the watersheds, and presentations to community organizations. Between July 2012 and June 2013, 97 septic tank pumpouts, nine septic system repairs, seven septic system replacements, and one alternative waste treatment system were completed in the watersheds.

The pollution reductions resulting from BMP installations are summarized in the table below.

Table II-27: Robinson River and Little Dark Run BMP
Summary: July 2012 – June 2014

Control Measure**	Units*	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	F		----	0
Stream Exclusion Fencing	S	562	----	0
Pasture Management	Ac	37,250	----	0
Reforestation of Erodible	Ac	165	----	0
Manure incorp. Into Soil	Ac	1,363	----	0
Veg. Cover on Cropland	Ac	325	-----	0
Urban/Residential Pet Waste				
Pet Waste Digester	S	35	----	0
CCU Waste Treat. System	S	3	----	0
New Conventional Septic	S	116	----	0
Pet waste Education Program	P	1	-----	0
Residential Septic				
Septic Tank Pump Out	S	364	97	27
Septic System Repair	S	436	9	2
Septic System Installation	S	219	7	3
Alternative Waste Treatment	S	85	1	1

*Ac = Acres, S = System, F = Feet, P = Program, CCU = Concentrated Canine Unit

Table II-28: Pollution Reductions for Robinson River and Little Dark Run: July 2012-June 2014

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation- Siltation tons/year
July 2012-June 2013	1.12E+12	665	-	114

State Project Report - Christians Creek and South River TMDL Implementation Project: July 2006 – June 2014

The Christians Creek and South River implementation project for bacteria, sediment and phosphorus impairments was initiated in 2006. DCR contracted with the Headwaters Soil and Water Conservation District and provided funding through the Water Quality Improvement Fund (WQIF) for project implementation. In FY14 the project concluded its eight year of agricultural BMP implementation. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2014. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share amount for these BMPs was \$750,685.

Stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (57,249 linear feet), and CRWP-2 practice (1,440 linear feet) and the TMDL fencing practices: LE-1T (25,258 linear feet), LE-2T (8,833 linear feet), and SL-6T (49,488 linear feet). This totals 27 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Christians Creek and the South River from the Impaired Waters List. The bar graph shows the percent violation rates for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year are shown above each bar within the graphs. A linear trend fitted to the Christians Creek data shows a significant decreasing trend in violation rate over the sampling period, but no samples have been collected since 2008. The decreasing trends in violation rates indicate significant improvement in water quality conditions in Christians Creek.

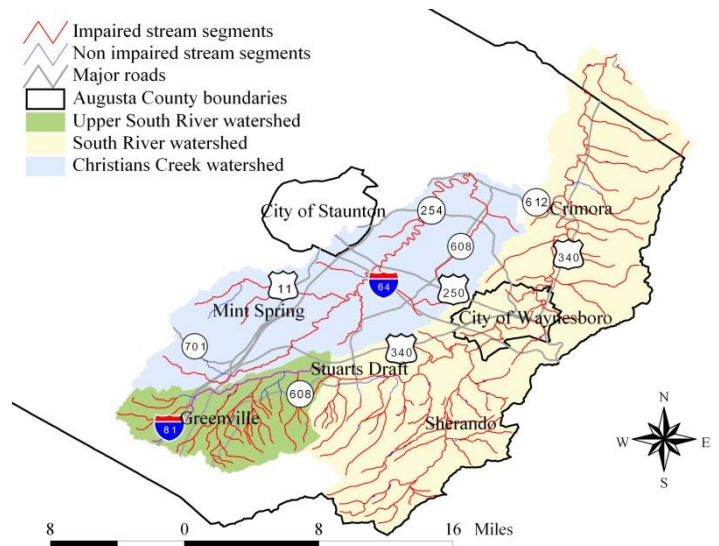
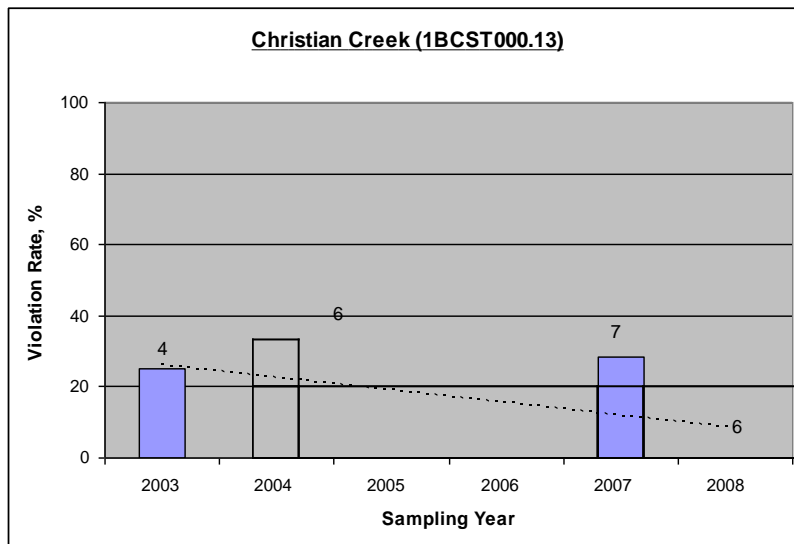
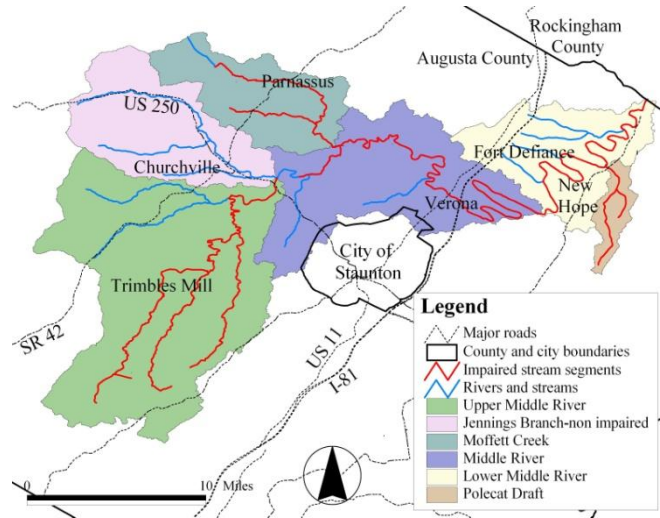


Table II-29: Christians Creek and South River BMP Summary: 2006-2014

Practice Code	Extent Installed	Unit
CRFR-3	128	Acres
CRLF-1 (buffer)	5,800	Lin. Feet
CRSL-6	57,249	Lin. Feet
CRWP-2	1,440	Lin. Feet
FR-1	22	Acres
LE-1T	25,258	Lin. Feet
LE-2T	8,833	Lin. Feet
NM-3	311	Acres
NM-4	128	Acres
SL-1	374	Acres
SL-6T	49,488	Lin. Feet
SL-7T	6	Acres
SL-8B	3,629	Acres
SL-8H	3,312	Acres
WL-1	6	Acres
WL-2	2	Acres
WL-3	9	Acres
WP-4	4	System
WQ-4	65	Acres

State Project Report - Moffett Creek, Middle River and Polecat Draft TMDL Implementation Project : July 2006 – June 2014

The Moffett Creek, Middle River and Polecat Draft TMDL implementation project for bacteria impairments in all three watersheds and sediment impairments in the Moffett Creek and the Upper Middle River was initiated in 2006. DCR contracted with the Headwaters Soil & Water Conservation District and provided Water Quality Improvement Funds (WQIF) towards the project implementation. In FY14 the project concluded its eighth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2014. BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$1,380,166.



Stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (75,271 linear feet), and CRWP-2 practice (2,389 linear feet), and through TMDL fencing practices: LE-1T (21,505 linear feet), LE-2T (9,130 linear feet), and SL-6T (143,030 linear feet). This totals 52 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Moffett Creek, Middle River, and Polecat Draft from the Impaired Waters List.

The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year is shown above each bar within the graph. A linear trend fitted to the Moffett Creek data shows a slight decreasing trend in violation rates over the sampling period, indicating some improvement in water quality conditions in Moffett Creek.

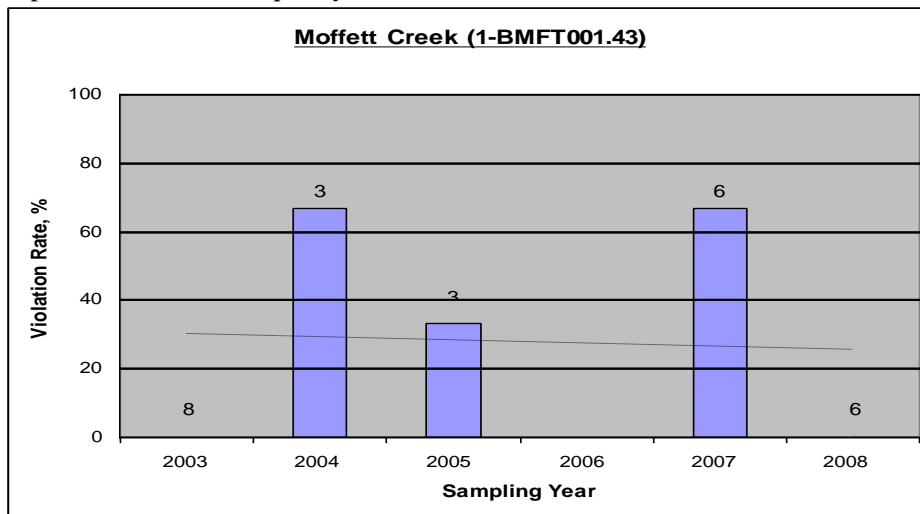
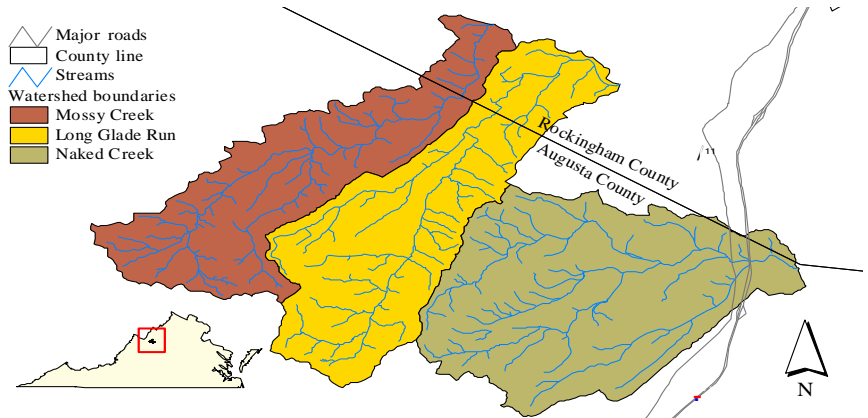


Table II-30: Moffett Creek, Middle River & Polecat Draft BMP Summary: 2006-2014

Practice Code	Extent Installed	Units
CRFR-3	332	Acres
CRLF-1 (buffer)	9,611	Lin. Feet
CRSL-6	75,271	Lin. Feet
CRWP-2	2,389	Lin. Feet
FR-1	40	Acres
LE-1T	21,505	Lin. Feet
LE-2T	9,130	Lin. Feet
NM-3	1,440	Acres
SL-1	815	Acres
SL-6T	143,030	Lin. Feet
SI-7T	4	Acres
SL-8B	6,204	Acres
SL-8H	8,220	Acres
SL-11	1	Acres
WL-1	25	Acres
WL-2	30	Acres
WL-3	18	Acres
WP-2	22,045	Lin. Feet
WP-4	7	System
WP-4B	1	System
WP-4C	2	Facility
WQ-1	11	Acres
WQ-4	472	Acres

State Project Report - Mossy Creek, Naked Creek & Long Glade Run TMDL Implementation Project : July 2006 – June 2014

The Mossy and Naked Creeks and Long Glade Run implementation project for bacteria impairments in all three watersheds and aquatic life impairment attributed to sediment in Mossy Creek was initiated in 2006. DCR contracted with the Headwaters Soil & Water Conservation District and provided funding from the Water Quality Improvement Fund (WQIF) for project implementation. In FY14 the project concluded its eighth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2014. BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$657,613. DCR and the Headwaters Soil and Water Conservation District decided to scale back targeted TMDL funding in FY13 and fund only stream exclusion practices.



Stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (10,830 linear feet), and CRWP-2 practice (3,800 linear feet) and the TMDL fencing practices: LE-1T (14,205 linear feet), LE-2T (5,885 linear feet), and SL-6T (30,176 linear feet). This totals 12 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Mossy and Naked Creeks and Long Glade Run from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year are shown above each bar within the graph. Data for Naked Creek shows a slight decreasing trend in violation rates over the sampling period. The decreasing trend in violation rates indicates some improvement in Naked Creek.

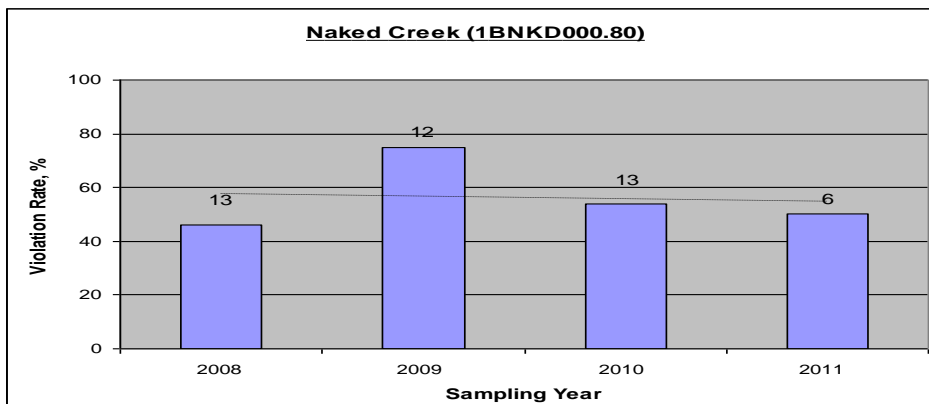


Table II-31: Mossy & Naked Creeks & Long Glade Run BMP Summary 2006-2014

Practice Code	Extent Installed	Unit
CRFR-3	85	Acres
CRLF-1 (buffer)	15,311	Lin. Feet
CRSL-6	10,830	Lin. Feet
CRWP-2	3,800	Lin. Feet
LE-1T	14,205	Lin. Feet
LE-2T	5,885	Lin. Feet
SL-1	71	Acres
SL-6T	30,176	Lin. Feet
SL-7T	7	Acres
SL-8B	3,267	Acres
SL-8H	2,183	Acres
WL-1	2	Acres
WL-2	33	Acres
WL-3	35	Acres
WP-4	4	System
WQ-4	259	Acres

State Project Report - Falling River TMDL Implementation Project: July 2006 – June 2014

The Falling River implementation project for bacteria impairment was initiated in 2006. DCR contracted with the Robert E. Lee Soil and Water Conservation District and provided Water Quality Improvement Funds (WQIF) towards the project implementation. In FY14 the project concluded its eighth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2014. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$1,740,733. From July 1, 2013 through June 30, 2014 eight livestock exclusion practices were installed.

A considerable amount of stream fencing has been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (29,480 linear feet), and the TMDL fencing practices: LE-1T (108,029 linear feet), LE-2T (7,050 linear feet), SL-6 (122,684 linear feet), and WP-2T (16,700 linear feet). This totals 54 miles of livestock stream exclusion fencing installed.

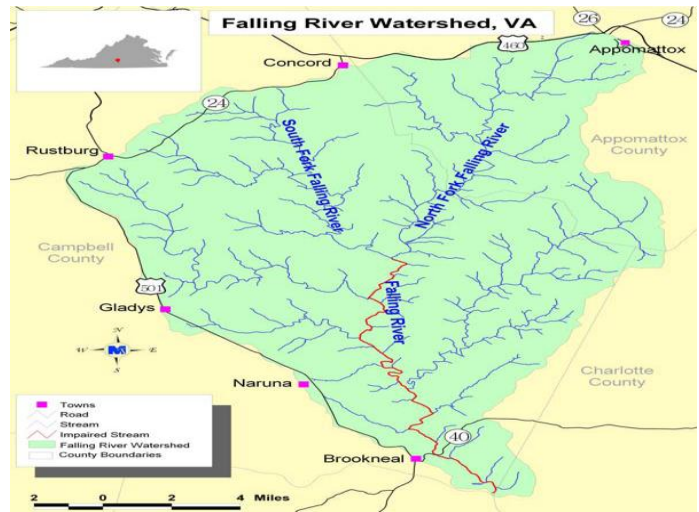
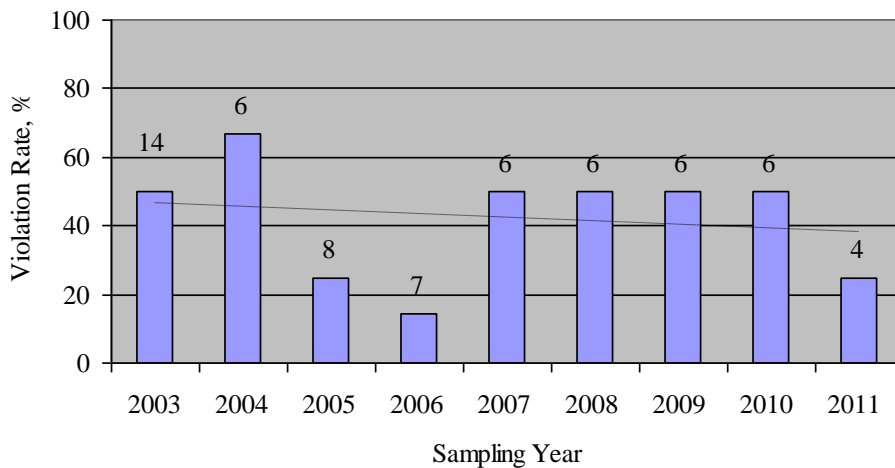


Table II-32: Falling River BMP Summary: 2006-2014

Practice Code	Extent Installed	Unit
CRFR-3	98	Acres
CRSL-6	29,480	Lin. Feet
CRWQ-1	6	Acres
FR-1	198	Acres
LE-1T	108,029	Lin. Feet
LE-2T	7,050	Lin. Feet
NM-1	1,020	Acres
NM-2	697	Acres
SL-6T	122,684	Lin. Feet
SL-6B	6,664	Acres
SL-7T	19	Acres
SL-8B	1,786	Acres
SL-8H	1,550	Acres
SI-10T	96	Acres
SL-11	2	Acres
WP-2A	255	Lin. Feet
WP-2T	16,700	Lin. Feet
WP-3	3	Acres

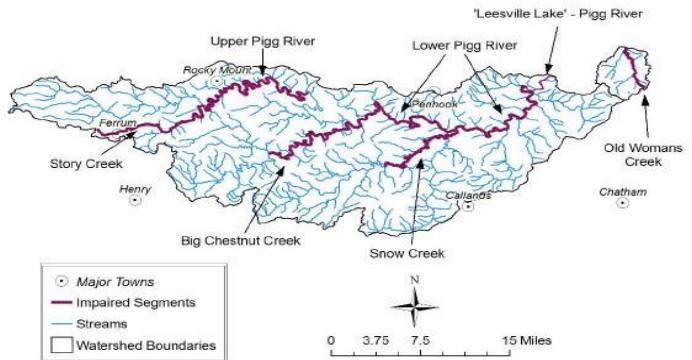
The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Falling Creek from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year is shown above each bar within the graph. A linear trend fitted to the data shows a slight decreasing trend in violation rates over the sampling period. The decreasing trend in violation rates indicates some improvement in water quality condition in the Falling River.

Falling River (4AFRV010.99)



State Project Report - Pigg River TMDL Implementation Project (Blue Ridge SWCD): July 2006 – June 2014

The Pigg River implementation project for bacteria impairments was initiated in 2006. DCR contracted with the Blue Ridge and Pittsylvania Soil and Water Conservation Districts and provided funding from the Water Quality Improvement Fund (WQIF) for implementation. Project summary provided includes progress made by the Blue Ridge SWCD in the Upper Pigg River, Story Creek, Chestnut Creek, and Snow Creek watersheds. In FY2014 the project completed its eighth year of implementation of various agricultural BMPs. The table below lists BMPs implemented in the watersheds within the period of 2006 through June 2014. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for BMPs installed throughout the project period are \$1,588,908. Blue Ridge Soil and Conservation District installed 18 on-site sewage disposal practices in the watershed in FY13, these included replacement of 16 failing septic systems and the repair of two septic systems. Funds were provided through a Water Quality Improvement Fund grant award from DCR.



The stream fencing has been installed through the TMDL fencing practices: LE-1T (110,280 linear feet), LE-2T (1,784 linear feet), and SL-6T (71,230 linear feet). This totals 335 miles of livestock stream exclusion fencing installed which is 60 percent of the fencing goal quantified in the TMDL implementation plan.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove the impaired stream segments from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year is shown above each bar within the graph. A trend fitted to the data at river mile 52.73 shows a significant decreasing trend in violation rates over the sampling period. The decreasing trend in violation rates indicates improvement in water quality conditions in the Pigg River.

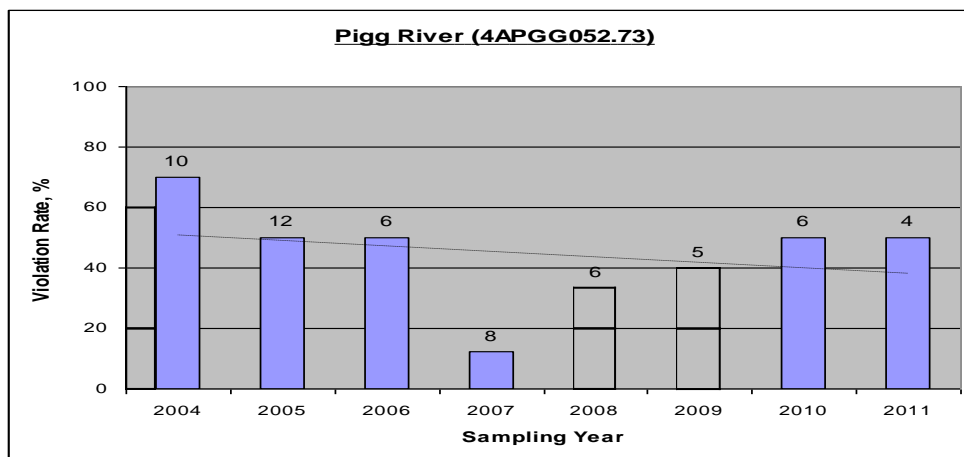
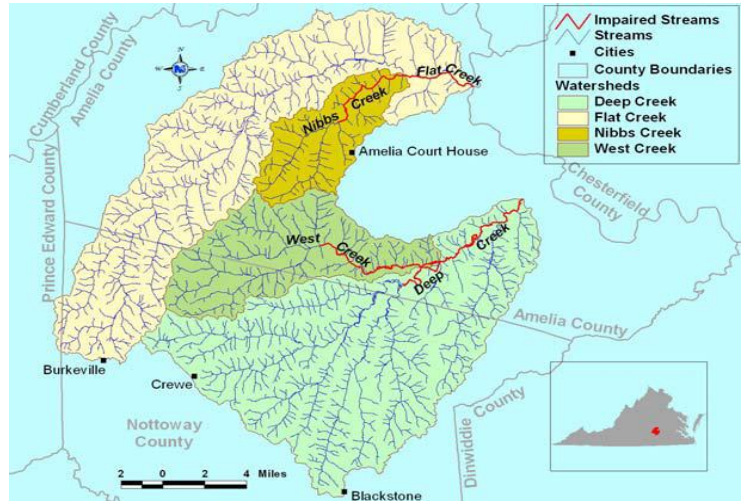


Table II-33: Pigg River BMP Summary (Blue Ridge SWCD): 2006-2014

Practice	Extent	Unit
FR-1	82	Acres
LE-1T	110,547	Lin. Feet
LE-2T	1,784	Lin. Feet
SL-6T	71,230	Lin. Feet
SL-8B	3,335	Acres
SL-8H	2,953	Acres
SL-11	10	Acres
WP-4	2	System
WP-4B	10	System
RB-3	2	System
RB-4	14	System
RB-4P	2	System

State Project Report - Flat, Nibbs, Deep and West Creeks TMDL Implementation Project : July 2006 – June 2014

The Flat, Nibbs, Deep, and West Creeks implementation project for bacteria impairments was initiated in 2006. DCR contracted with the Piedmont Soil and Water Conservation District and provided Water Quality Improvement Funds (WQIF) towards the project implementation. In FY2014 the project concluded its eighth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2014. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$1,002,270.

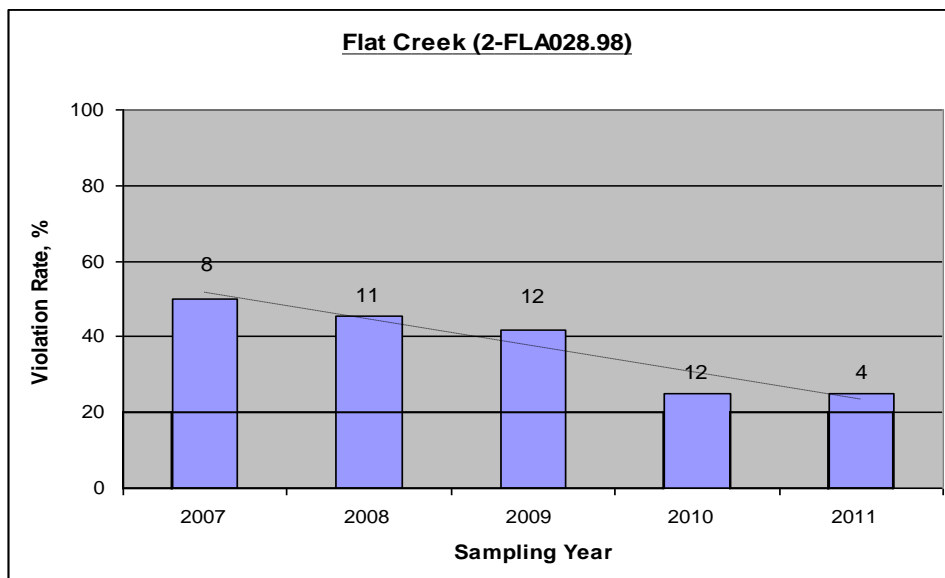


Stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (17,154 linear feet) and the state fencing practices: LE-1T (62,339 linear feet), LE-2T (11,100), SL-6 (45,489 linear feet), SL-6T (13,203 linear feet), and WP-2T (29,809 linear feet). This totals 34 miles of livestock stream exclusion fencing installed. A total of 180 acres have been enrolled under a new pasture management BMP.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove the impaired creeks from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year are shown above each bar within the graph. The trend fitted to the data at river mile 28.98 shows a significant decreasing trend in the violation rates over the sampling period. The decreasing trend indicates significant improvement in water quality conditions in Flat Creek.

Table II-34: Flat, Nibbs, Deep & West Creeks BMP Summary: 2006-2014

Practice Code	Extent Installed	Unit
CP-CNT	111	Acres
CRFR-3	49	Acres
CRSL-6	17,154	Lin. Feet
FR-1	130	Acres
LE-1T	52,649	Lin. Feet
LE-2T	11,100	Lon. Feet
NM-3B	55	Acres
SL-1	174	Acres
SL-6	45,489	Lin. Feet
SL-6T	6,803	Lin. Feet
SL-8B	2,590	Acres
SL-8	38	Acres
SL-8H	3,973	Acres
SL-10T	180	Acres
SL-11	1	Acres
SL-15A	146	Acres
SL-15B	176	Acres
WP-2T	29,809	Lin. Feet
WP-3	1,477	Acres
WP-4	3	Systems
WQ-4	1,471	Acres



State Project Report - Spring, Briery & Saylers Creeks, Little Sandy & Bush Rivers TMDL Implementation Project: July 2006 – June 2014

The Spring Creek, Little Sandy River, Bush River, Briery and Saylers Creeks implementation project for bacteria impairments was initiated in 2006. DCR contracted with the Piedmont Soil & Water Conservation District and provided Water Quality Improvement Funds (WQIF) for BMP implementation. In FY14 the project concluded its eighth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2014. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$994,505.

A considerable amount of stream fencing has been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (38,212 linear feet), and the TMDL fencing practices: LE-1T (82,825 linear feet), LE-2T (2,190 linear feet), SL-6 (65,841 linear feet), SL-6T (14,237 linear feet), WP-2 (2,993 linear feet) and WP-2T (10,994 linear feet). This totals 41 miles of livestock stream exclusion fencing installed. Water source has been extended to 23 acres for grazing management and 47 acres have been enrolled under a new pasture management BMP.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Spring Creek, Little Sandy River, Bush River, and Briery and Saylers Creeks from the Impaired Waters List.

The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year is shown above each bar within the graph. A linear trend fitted to the data of Little Sandy River shows significant decreasing trend in the violation rate over the sampling period.

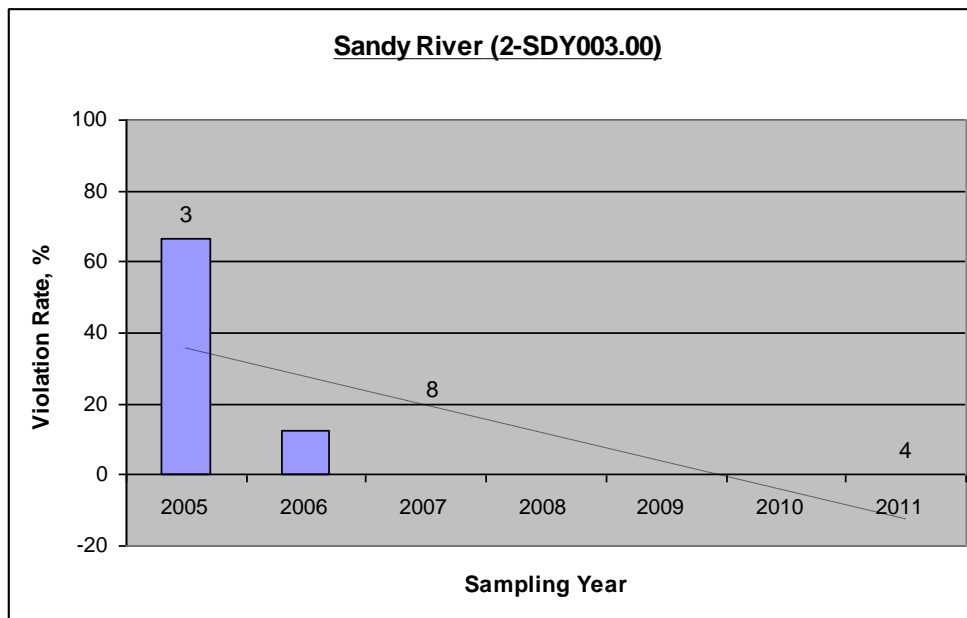
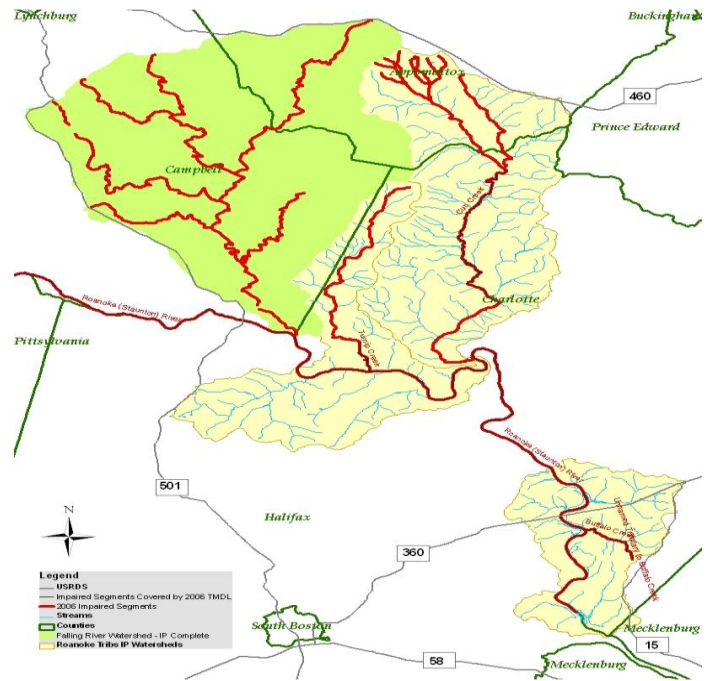


Table II-35: Spring, Briery, Saylers Creeks & Bush and Little Sandy Rivers BMP Summary: 2006-2014

Practice Code	Extent Installed	Unit
CRFR-3	170	Acres
CRSL-6	38,212	Lin. Feet
FR-1	339	Acres
LE-1T	82,825	Lin. Feet
LE-2T	2,190	Lin. Feet
SL-1	218	Acres
SL-6	65,841	Lin. Feet
SL-6T	14,237	Lin. Feet
SL-7T	23	Acres
SL-8B	1,202	Acres
SL-8H	1,030	Acres
SL-10T	47	Acres
SL-11	4	Acres
WP-1	1	Count
WP-2	2,993	Lin. Feet
WP-2T	10,994	Lin. Feet
WP-4C	1	System
WP-4B	1	System

State Project Report - State Project Report - Cub, Turnip and Buffalo Creeks TMDL Implementation Project: July 2006 – June 2014

The Cub, Turnip and Buffalo Creeks implementation project for bacteria impairments was initiated in 2006. DCR contracted with the Robert E. Lee and Southside Soil and Water Conservation Districts (SWCD) and provided funding from the Water Quality Improvement Fund (WQIF) towards project implementation. The BMPs implemented and cost-share amounts paid by each district are noted separately. The project is now in its eight year of the implementation of various agricultural BMPs. This project was awarded additional funding as of July 1, 2012 for the Appomattox County portion only (Robert E. Lee SWCD). The tables below list all BMPs implemented within the period of 2006 through June 2014. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$712,040 (\$543,806 through Southside SWCD and \$168,234 through Robert E. Lee SWCD). The change in water quality reflects the cumulative impact of all BMPs implemented in the watersheds.



**Cub, Turnip, and Buffalo Creeks Southside
SWCD BMP Summary: 2014**

SWCD	Practice Code	Extent Installed	Extent Unit
Southside	CCI-SE1	1,620	Lin. Feet
	FR-1	105	Acres
	LE-1T	22,143	Lin. Feet
	SL-1	70	Acres
	SL-6	64,536	Lin. Feet
	SL-15A	53	Acres
	SL-3	12	Acres
	SL-8B	63	Acres
	WP-4B	1	System
	WP-4F	1	Facility
R.E. Lee	CRSL-6	4,100	Lin. Feet
	FR-1	27	Acres
	LE-1T	12,800	Lin. Feet
	SL-6T	12,200	Lin. Feet
	SL-8B	47	Acres

The stream fencing by Southside SWCD has been installed through the TMDL fencing practices LE-1T (22,143 linear feet) and SL-6 (64,536), and CCI-SE1 voluntary practice (1,620 linear feet). Robert E. Lee stream fencing has been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 (4,100 linear feet), and the TMDL fencing practices: LE-1T (12,800 linear feet) and SL-6T (12,200 linear feet). This totals 22 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Cub, Turnip and Buffalo Creeks from the Impaired Waters List.

In 2015 Cub Creek became an EPA Success Story that was produced and submitted to EPA by DEQ. The success was based on DEQ removing 14.07 miles in Cub Creek from the impaired waters list based on the 2012 statewide Water Quality Integrated Report. DEQ bacteria monitoring indicated that along the 14 plus miles the bacteria recreational contact standard was met. This was attributed to landowners implementing agricultural best management practices in the Cub Creek watershed since 2007.

State Project Report: Southern Rivers Livestock Exclusion Initiative TMDL Implementation Project: July 2012-June 2014

The Southern Rivers Livestock Exclusion Initiative project was initiated in 2012. DCR contracted with the Halifax, Patrick, and Pittsylvania Soil & Water Conservation Districts and provided Virginia Natural Resources Commitment Funds towards the implementation of stream fencing practices. The project is focusing on implementing stream exclusion BMPs in the Upper Banister River & Tributaries (Pittsylvania County); Lower Banister River and Polecat Creek (Halifax County), and North Fork, South Fork and mainstem of the Mayo River (Patrick County). All three watershed areas have completed TMDL implementation plans for streams impaired due to bacteria. The table below lists all BMPs implemented in the project area within the period of July 1, 2012 through June 30, 2014. The total cost-share payments for these BMPs were \$665,165.

The stream fencing practices installed included: LE-1T (41,300 linear feet), SL-6T (21,800 linear feet), LE-2T (5,580 linear feet), and WP-2T (925 linear feet) which total 69,605 linear feet or 13.2 miles of stream fencing. Of the 13.2 miles of stream fencing, a total of 11.4 miles or 86% was installed in FY 2014. This equated to 24 livestock exclusion systems installed by the three Districts.

Table II-37: Southern Rivers Livestock Exclusion, July 2012 – June 2014

Practice Code	Extent Installed	Unit
LE-1T	41,300	Lin. Feet
SL-6T	21,800	Lin. Feet
LE-2T	5,580	Lin. Feet
WP-2T	925	Lin. Feet

Glossary of Acronyms

BMP – Best Management Practice
CB – Chesapeake Bay
CD – Consent Decree
CFU – Colony Forming Units
CREP – Conservation Reserve Enhancement Program
DCR – Department of Conservation and Recreation
DEQ – Department of Environmental Quality
DMME – Department of Mines, Minerals and Energy
DOT – Department of Transportation
EPA – U.S. Environmental Protection Agency
FY – Virginia Fiscal Year
FFY – Federal Fiscal Year
GA – General Assembly
NPS – Nonpoint Source
NRCS – USDA Natural Resources Conservation Service
SR – Southern Rivers
SWCD – Soil and Water Conservation District
TMDL – Total Maximum Daily Load
TMDL IP – Total Maximum Daily Load Implementation Plan
USDA – United States Department of Agriculture
VSMP – Virginia Stormwater Management Program
VNRFCF – Virginia Natural Resources Commitment Fund
WIP – Watershed Implementation Plan
WQIF – Water Quality Improvement Fund

